

Show your work and/or explain your thinking for each problem.

Set 1

- 1) For the first movie of the day, the movie theater sold 120 children's tickets for \$5.00 a piece, and 55 adult tickets for \$7.00 a piece. What are the total sales, in dollars, for all tickets sold to the first movie?
- 2) Lauren is saving pennies every day. On the first day she saved two pennies. On the second day she saved four pennies, on the third day she saved eight pennies, and on the fourth 16. If this pattern continues how many pennies will she save on the 8th day?
- 3) I am a number. If you multiply me by 5 and then add 13 the result will be 88. What number am I?
- 4) Which number rounded to the nearest whole number is 56?
55.39
 $56\frac{4}{9}$
56.59
 $55\frac{1}{8}$
- 5) Tom delivered newspapers on Sunday mornings. Last Sunday he delivered 256 papers. This Sunday he delivered 42 **fewer** papers. How many papers did he deliver this Sunday?
- 6) Olympus Mons, one of the largest volcanoes on Mars, has a diameter of about 550 kilometers. What is the approximate distance around the Olympus Mons volcano? Use $\pi = 3.14$.
- 7) Olympus Mons, one of the largest volcanoes on Mars, has a diameter of about 550 kilometers. What is the approximate area of the Olympus Mons volcano? Use $\pi = 3.14$.
- 8) Farmer Jane has only pigs and chickens on her farm. She can't remember how many of each she has but she does know she counted 110 legs and 35 heads. Assuming that each animal is normal, how many of each animal does she have?
- 9) Taylor multiplied two different prime numbers together. How many different factors does this number have?
- 10) Robert's model train is set up on a circular track. There are 9 telephone poles spaced evenly around the track. It takes the first car 6 seconds to go from the first pole to the fourth pole. How long will it take for the first car to go all the way around the track?

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Set 2

1) The product of two whole numbers is 72. What is the **smallest** difference between the two whole numbers?

2) Write the fraction, the decimal, and the percent that represents the shaded portion of the figure shown.



3) Hannah made a list of all of the three digit whole numbers where **all** three digits were even. How many three digit whole numbers were on Hannah's list?

4) Kristina and 8 of her friends collected \$153.00 to spend at the county fair. How much does each person have to spend if the money will be divided evenly?

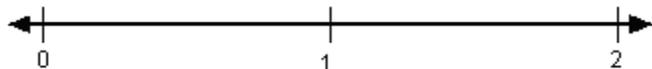
5) Kelly had a nail that was $\frac{7}{8}$ of an inch in length. He hammered it into a piece of wood that was $\frac{3}{4}$ of an inch thick. How much of the nail was sticking out of the wood?

6) What is the sum of the largest two prime numbers less than 50?

7) Robyn was told not to run during a baseball game but she decided to do it anyway. She took 25 steps from first base to second, was about to get caught and took 8 steps back, then took 4 forward 6 back and was tagged one-third of the way between first base and second. How many of Robyn's steps was it from first base to second base?

8) Use arrows to indicate the location of the following fractions on the number line shown. Label the arrows with the fraction indicated.

$1\frac{2}{3}, \frac{4}{5}, 1\frac{2}{9}, 1\frac{3}{8}, \frac{4}{9}$



9) Ms. Hanlon's class is playing a game in which students are to estimate the width of their classroom to the nearest centimeter. The estimates are placed on a class number line and the student with the closest estimate wins. Here are the estimates of 5 members of the class. Draw a number line and place the 5 estimates in the correct location.

Ramon 8.7 meters Elise 9.3 meters Derek 9.1 meters

Francis 7.9 meters Tania 9.7 meters

The actual distance was 9.48 meters. Who won the game?

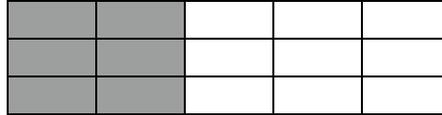
10) A piece of ribbon 180 cm is cut into two pieces. One piece is 4 times longer than the other. How long are the two pieces in centimeters?

Set 3



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- 1) Write the fraction, the percent that represents portion of the figure shown.



decimal, and the shaded

- 2) The Goodman Cake Factory sells whole cakes, but they also sell cake by the halves, quarters, and eighths. If $\frac{1}{4}$ of a cake costs \$6.48. How much will $\frac{3}{8}$ of a Goodman cake cost?
- 3) Mr. Shepherd's class went to the Fun Palace Amusement Park. There are 33 students in Mr. Shepherd's class and $\frac{2}{3}$ of them decided to ride the roller coaster. How many students rode the roller coaster?
- 4) The Rock Club held a car wash to raise money for a field trip. They washed 36 cars and raised \$198.00. What was the price of one car wash?
- 5) The three angles of a triangle can measure 25° , 45° , and $\underline{\hspace{1cm}}$ °.
- 6) The area of a square is 49 square centimeters. What is its perimeter in centimeters?
- 7) The perimeter of a rectangle is 50 inches. If the length is 4 times longer than the width what is the **area** of the rectangle?
- 8) In December you measured 5 feet 2 inches and your brother measured 4 feet 10 inches. One year later you measured 5 feet 6 inches and your brother measured 5 feet 3 inches. Who grew more during the year?
- 9) The number 100 can be written as the sum of a one digit prime number and a two digit prime number. What are the prime numbers?
- 10) What one digit number can be added to both the numerator and the denominator of $\frac{18}{25}$ so that the resulting fraction is equivalent to $\frac{3}{4}$?

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Set 4

- 1) Which pay scale would you prefer?

Pay scale A: \$2.00 for every $\frac{1}{3}$ hour worked

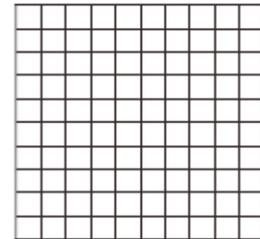
Pay scale B: \$6.00 for every $\frac{3}{4}$ hour worked

- 2) Dahlia's teacher asked her how long she spent studying for her fraction test. She told her teacher she spent the reciprocal of $\frac{2}{3}$ hours studying. How many hours did Tahlia spend studying? Express your answer as a mixed number.

- 3) What digit is in the ones place of 2^{50} ?

- 4) A rectangle has a perimeter of 36 cm and an area of 45 cm^2 . What are the length and the width of the rectangle?

- 5) Shade 65% of the following grid. What are the equivalent decimal, and fraction in lowest terms represented by the shaded region?



- 6) Danica is buying food for a party. Hotdog buns come in packages of 24 and hotdogs come in packages of 16. What is the fewest number of packages of each that she must buy to have an equal number of hotdogs and hotdog buns?

- 7) Which of the signs has **no** parallel sides?



- 8) Marco lives $\frac{8}{10}$ of a mile from the school. Dakota lives $\frac{7}{8}$ of a mile from the same school. Who lives **further** from the school?

- 9) The width of a rectangle is 3^2 inches and its length is 3^3 inches. What is the area of the rectangle in inches?

- 10) At the Valley Grocery Store a pound of chicken costs \$3.60. How much does $\frac{3}{4}$ of a pound of chicken cost?

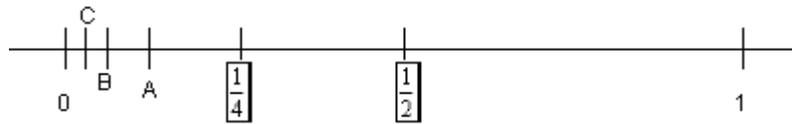
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Set 5

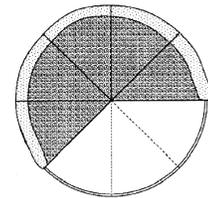
- 1) What is the ratio of pencils to crowns in the picture shown?



- 2) Find two numbers whose GCF (greatest common factor) is 4 and whose LCM (least common multiple) is 40.
- 3) The linear unit shown is divided in halves. Then one of the halves is divided into halves. If you continued to divide the smallest part into halves what would the next 3 fractional parts; A, B, and C be called?



- 4) Your school district has decided to add 50 minutes to the school day. The time will be divided equally amongst each of your classes. If you go to school 180 days a year, how many **hours** of class time will be added over the entire year?
- 5) What is the sum of the reciprocals of the first three prime numbers?
- 6) Of 50 students surveyed 12 said they had moved from another school in the last 6 months. If this is representative of the school as a whole and there are 450 students in the school, how many of them moved in the last 6 months?
- 7) On my scooter the diameter of the rear wheel is 5 cm larger than the diameter of the front wheel. What is the ratio of the circumference of the wheels in simplest form? Leave the answer in terms of π
- 8) Joe ate 3 slices of the pizza shown below. What fraction of the pizza remains? Express your answer in simplest form.



- 9) An elevator will hold either 24 children or 16 adults. If there are 18 children already on the elevator, how many adults can still get on?
- 10) Find two consecutive numbers whose product is 156.
- 11) A sandwich shop offers a choice of ham, turkey, or roast beef and a choice of American or provolone cheese. How many different sandwiches can they make with one meat and one cheese?

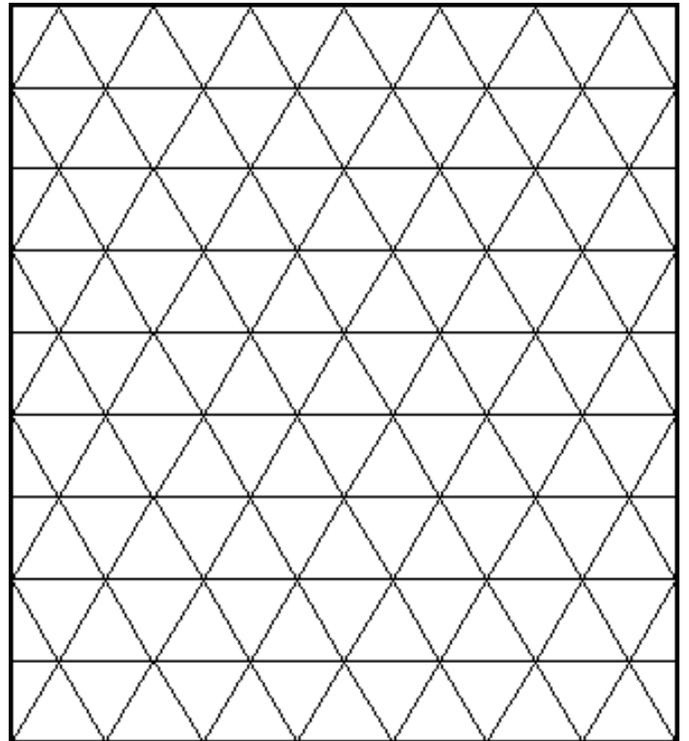
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Set 6

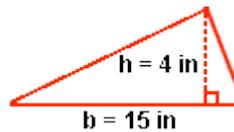
- 1) A square has an area of 81 square cm. What is the length of the side of the square?
- 2) What digit is in the ones place of the number 3^{52} ?
- 3) Explain three different methods you could use to determine which of the following fractions is larger: $\frac{9}{10}$ or $\frac{11}{12}$.
- 4) $\frac{2}{5}$ of the students attending the basketball game are 7th graders. There are 245 students at the basketball game. How many are 7th graders?

- 5) On the grid shown below find, shade, and label the following figures:

an equilateral triangle,
a regular hexagon,
an isosceles trapezoid,
a parallelogram,
and an isosceles triangle that is **not** equilateral.



- 6) I am a number. If you triple my number, add 5, and then divide me by 2 the result will be 22. What number am I?
- 7) What is the area of the triangle shown?



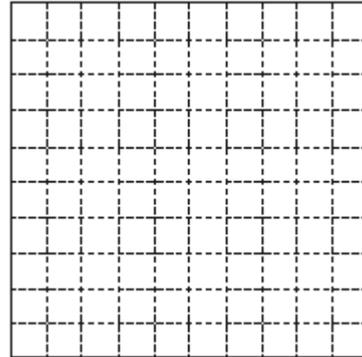
Show your work and/or explain your thinking for each problem.

Set 6 continued

- 8) Brandon says that if you multiply a number by 10 the product will always be greater than 10. David disagrees and says that sometimes the product is smaller than 10. Who is correct? Explain your reasoning.
- 9) What is the sum of the interior angles of the polygon shown below?



- 10) Shade 40% of the grid provided. What is the decimal and fraction equivalent?
Express the fraction in simplest form.



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Set 7

- 1) The top of Mt. McKinley in Alaska is the highest point in North America at 20,322 feet. The lowest point in North America is located in Death Valley at -282 feet, or 282 feet below sea level. What is the difference between the two points?

The table below shows the high and low temperatures of four planets in degrees Fahrenheit. Use the information provided to answer then next **two** questions.

Planet	Earth	Mars	Mercury	Pluto
Low	-129	-225	-279	-387
High	136	63	801	-369

- 2) What are the low temperatures in order from least to greatest?
- 3) What is the difference between the least high temperature and the greatest high temperature?
- 4) The stem and leaf plot below shows the price for a 16 ounce bag of chips at 20 stores. What was the lowest and the highest price found? What is the range of the prices? What is the median price?

Prices for 16 oz Bags of Potato Chips

09 0 9
10 0 0 5 5 9
11 0
12 0 0 0 9 9 9 9
13 5 5 9 9 9

Key 12 0 represents \$1.20

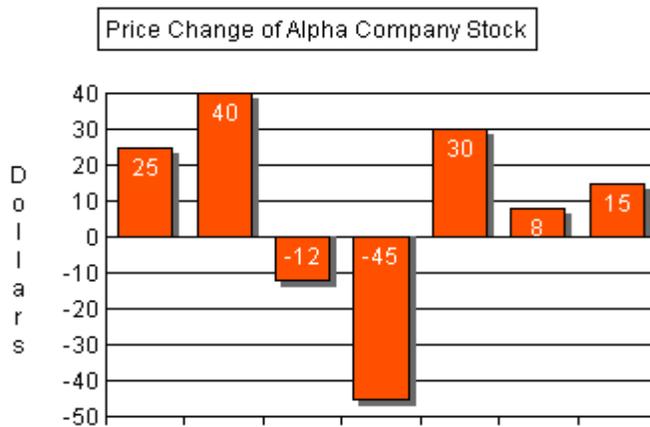
- 5) A rectangular prism has a length, width, and height of 10 units, 6 units, and 4 units respectively. The prism is made up of cubes that are 1 unit on each side. The six faces of the prism are painted red. How many of the cubes have exactly one face painted red?
- 6) A telephone call cost \$1.25 for the five minutes and \$.035 for each minute after. How much would a 25 minute phone call cost?
- 7) On a game show the first five contestants won a mean average of \$150.00. The next five won a mean average of \$180.00. What was the mean average won by the 10 contestants?
- 8) The mean of 6 numbers is 50. When one of the numbers was removed the mean is 54. What number was removed?

Show your work and/or explain your thinking for each problem.

Set 7 continued

9) Michael Foale, an American astronaut, has spent more time in space than any other American. As of December 2006, Michael Foale had spent 374 days in space during six flights. What is the average number of days he has spent in space per flight? Round your answer to the nearest whole number.

10) The graph below shows the change in the value of Omega Company stock over one week. What was the net change in value of the stock for the week?



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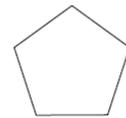
Set 8

- 1) A football team must gain at least 10 yards to earn a first down. The Desert Devils football team gained 8 yards, lost 3 yards, lost 6 yards, and then gained 13 yards. Did they make a first down? Explain your reasoning.
- 2) Vicky needs to buy 4 new tires for her car. She found the following ads for local stores. At which of the three stores would Vicky get the best deal on tires?

TLC Tires	Large Lug Tires	Crown Tire Store
\$75.99 each	\$69.25 per tire	\$59.25 per tire
Buy 3 get one tire free!	25% off the total bill	

- 3) Hasina is making a beaded necklace. She uses 3 red, 1 blue, 2 white, 1 red, 1 crystal and then she starts over again. If she continues this pattern what color will the 52nd bead be?
- 4) A shoe store has reduced every pair of shoes $33\frac{1}{3}\%$. What will the reduced cost of a \$72.00 pair of shoes be?
- 5) Two numbers have a GCF, greatest common factor, of 15 and an LCM, least common multiple, of 420. One of the numbers is 60. What is the other number?
- 6) A square patch of grass measuring 7 feet by 7 feet uses approximately 3 ounces of fertilizer. How many ounces of fertilizer will be needed for a rectangular lawn that is 21 feet by 14 feet?
- 7) Gabriela is drawing a blueprint for a home she would like to build. The scale for the blueprint is 1 centimeters = 3 meters. The patio for the home is 10.5 meters long. How many centimeters long should the patio on the blueprint be?
- 8) Four days is what fractional part of the month of June? Express your answer in simplest form.

- 9) What is the sum of the interior angles of the polygon shown?



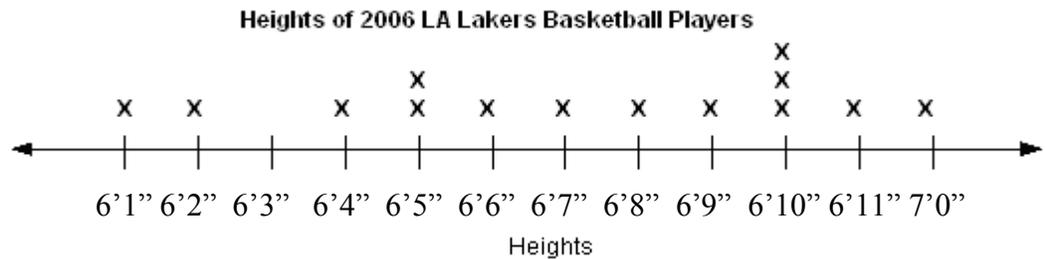
- 10) Members of the Euclid Math Club are raising money to attend a math conference. The total costs for the 25 members are shown in the table. How much money does each member need to raise in order to attend the conference?

Transportation	\$750
Lodging	\$600
Registration	\$625

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Set 9

- 1) The heights of the 2006 LA Lakers basketball team are shown in the line plot below. Complete the following statement from the data shown. Half of the players are less than _____ feet _____ inches in height.



- 2) Using the line plot shown above determine the minimum, maximum, median, and mode of the heights of the Lakers basketball players.
- 3) You have forgotten your three digit code to log on to the computers at school. You know the first digit is four but can't remember the other two. How many three digit codes could there be that begin with a 4?
- 4) $\sqrt{100} = \sqrt{64} + \sqrt{X}$ What is the value of X?
- 5) Winchester School requires that there are **at least** 2 adults for every 8 students on a field trip. There are 72 seventh graders going on a field trip. What is the minimum number of adults they will need?
- 6) Valentino and Jorge have weekend jobs. Valentino earned \$86.00 for 12 hours of work. Jorge earned \$75.00 for 10 hours of work. Who received the better hourly wage?
- 7) The larger of two complementary angles is 6 degrees more than twice the smaller. What are the measures of the two angles?
- 8) Friday was school spirit day at Flair Middle School. Students showed their school spirit by wearing school t-shirts. Ms. Flower has 32 students and 24 of them wearing school t-shirts. Mr. Green has 40 students and 28 of them were showing their school spirit. Which teacher had a greater percentage of students who participated in school spirit day?
- 9) Ms. Long can drive 150 miles in 3 hours. How many hours will it take her to drive 275 miles?
- 10) Of the following numbers which one is closest to 10?
10.01 9.9 1.099 9.991

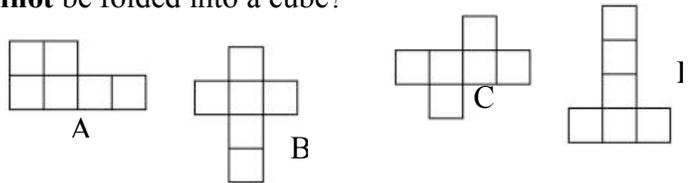
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Set 10

- 1) The Mountain School District has two middle schools. At each school the seventh-grade classrooms were invited to participate in a physical fitness test. The district wanted to give a prize to the school that had the **largest** part of the seventh graders participating. The tables below show the participation rates of the three schools. Which school had the **largest part** of their seventh graders participating?

Grey Middle School			Blue Middle School		
Room	Students	Participants	Room	Students	Participants
A	32	24	A	36	75%
B	30	24	B	33	$66\frac{2}{3}\%$
C	28	21	C	30	90%

- 2) One angle of a parallelogram is 57° . What are the measures of the other three angles?
- 3) 6 boats can carry 30 people across a river. How many boats will it take to carry 57 people across the river?
- 4) Tamika walked for 15 minutes to get to school. On the way home she stopped by the grocery store so the trip took her 30 minutes. What fraction of an hour did Tamika spend going to and from school?
- 5) Which of the following figures **cannot** be folded into a cube?



- 6) $\left(\frac{1}{5}\right)^1 = \frac{1}{5}$, $\left(\frac{1}{5}\right)^2 = \frac{1}{25}$ and $\left(\frac{1}{5}\right)^3 = \frac{1}{125}$. If you continue this pattern what will $\left(\frac{1}{5}\right)^5$ be?
- 7) Mia is planning a party for 24 guests. She estimates that one pizza will feed 3 people. If she wants to make sure that her guests are well fed, **without** spending too much money, what is the least number of pizzas she should order?

Show your work and/or explain your thinking for each problem.

Set 10 continued

8) Mr. Custer's restaurant bill was \$60.52. He wants to leave 20% as a tip. About how much should Mr. Custer leave for a tip?

9) An online survey was taken to determine the favorite cat breeds of cat lovers. The top 4 choices are shown in the table below.

How many people chose one of the top 4?

Approximately what percentage of the people chose the Maine Coon Cat as their favorite cat?

<u>Maine Coon Cat</u>	825
<u>Ragdoll</u>	465
<u>Siamese</u>	392
<u>Persian</u>	372

10) Abiel can read 200 words per minute. How long will it take him to read a story consisting of 3700 words?

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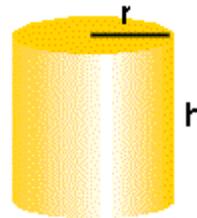
Set 11

- 1) 21 students attended Monday's orchestra rehearsal. That is 70% of the entire orchestra. How many students are in the entire orchestra?
- 2) Find the product of the 9 fractions. $\frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \times \frac{5}{6} \times \frac{6}{7} \times \frac{7}{8} \times \frac{8}{9} \times \frac{9}{10}$
- 3) Tara bought a \$120.00 jacket on sale for \$96.00. Rebecca bought a \$150.00 jacket on sale for \$116.00. They both saved \$24.00. What were their rates of discount?
- 4) Between what two integers is the $\sqrt{75}$?
- 5) $4^3 \times 4^3 = 2^?$
- 6) Name as many properties as you can that the two figures shown have in common.



- 7) What is the volume of a cube with a surface area of 150 square cm?

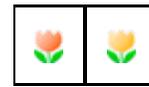
- 8) The cylinder shown has a radius of 10 cm and a height of 20 cm. What is the volume of the cylinder? Use $\pi = 3.14$.



Cylinder:
 $V = \pi r^2 h$

- 9) A rectangular prism has a width of 5 inches, a length of 7 inches, and a height of 15 inches. What is the volume of the prism?

- 10) Two flower stickers are shown at right.
would the approximate width of 50 stickers be?

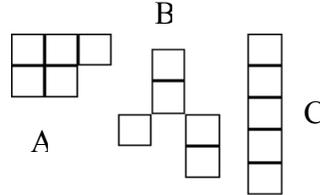


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Set 12

- 1) A \$10.00 bill is about 6 inches long. How many \$10.00 bills would it take to make a trail 1 yard in length?

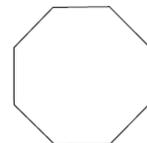
- 2) Which of the following arrangements of 5 squares has the greatest perimeter?



- 3) Create a stem and leaf plot showing the ages of the first ladies. Identify the range, the median, and the mode. What would you say the “average” age of the first ladies is? Explain your reasoning.

Ages of President’s First Ladies			
First Lady	Age	First Lady	Age
H. Clinton	45	E. Roosevelt	48
B. Bush	63	L. Hoover	54
N. Reagan	59	G. Coolidge	44
R. Carter	49	F. Harding	60
E. Ford	56	E. Wilson	52
P. Nixon	56	H. Taft	47
C. Johnson	50	E. Roosevelt	39
J. Kennedy	31	I. McKinley	49
M. Eisenhower	56	C. Harrison	56
E. Truman	60	F. Cleveland	21

- 4) The seventh-graders at Wiley Middle School printed 200 raffle tickets. They sold 184 of the tickets. What percentage of the raffle tickets did they sell?
- 5) Rod can drive 279 miles in 4.5 hours. How many miles per hour is this?
- 6) Marysol’s parents invested \$2000.00 in a savings account when she was born. The account is earning 6% simple interest. How much money will be in her savings account after one year?
- 7) A jet travels at 435.6 miles per hour. How far will it travel in $6\frac{1}{4}$ hours?
- 8) My sister is playing a dart game at an arcade. She can earn 2, 3, or 6 points with each dart. She scored 24 points. How many ways could she score 24 points given that each dart thrown landed on the dart board?
- 9) What percent of 30 is 40?
- 10) How many diagonals does an octagon have?

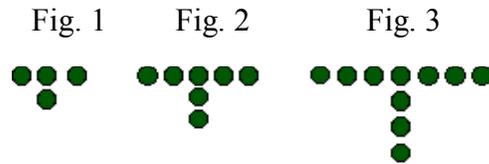


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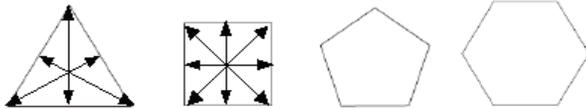
Set 13

- 1) Carlos and his friends went to the music store to buy CDs. Carlos bought twice as many as his friend Garrett. Garrett bought 4 more than their other friend Roxanne. Garrett bought 6 CDs. How many did Carlos and Roxanne buy?
- 2) Kalli's mother gave her \$30.00 to go to the grocery store. She bought 5 cans of peaches at \$0.88 per can, two frozen pizzas at \$7.49 each, and a bag of potatoes for \$2.99. How much change did Kalli get back?

- 3) If the pattern shown continues how many dots will there be in the 25th figure?



- 4) Which expression is easier to simplify: $4(267)$ or $4(200 + 60 + 7)$? Explain your reasoning.
- 5) Use the regular polygons to fill in the table provided. How many lines of symmetry does a regular decagon have?



Number of Sides	Lines of Symmetry
3	3
4	
5	
6	

- 6) How could you make the following expression easier to simplify? $7x2x3x5$
Which property(s) did you use?
- 7) There are 8 freshmen to every 7 sophomores at Red Sand High School. There are 1125 students in the two classes combined. How many of the students are freshmen?
- 8) How many perfect squares are there less than 200?
- 9) What is the positive difference between $\sqrt{121}$ and $\sqrt{225}$?
- 10) In 1837 President Andrew Jackson received a 1400 pound block of cheese. It was 4 feet in diameter and 2 feet high. What was the volume of the block of cheese?
 $V = \pi r^2 h$.

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Set 14

- 1) The students in Mrs. Flan's class were asked how many pets they owned. The results are shown in the tally table. What percent of the students own 3 **or fewer** pets?

Number of pets	Tally
0	
1	
2	
3	
4	
5	
6	

- 2) A carousel pole is painted three colors; blue, pink and white. $\frac{1}{3}$ of the pole is painted blue and $\frac{1}{4}$ is painted pink. How much will be painted white?
- 3) Craig was scuba diving in Florida. He was 15 meters below the surface when he saw a shark 11 meters below him. How many meters below the surface was the shark?
- 4) The Stinky Shoe Company's stock lost \$4.00 every day for a week. If the stock was selling for \$101.50 a share prior to the drop, what is the selling price after one week?
- 5) Juan likes to ride his bike. He rides 4.5 miles on Monday, 3.7 miles on Tuesday, and 6.8 miles on Saturday. What is the mean average mileage for the three days Juan rode?
- 6) The owner of a parking lot charges \$3.00 for the first hour and \$1.50 for every hour, or fraction of an hour, after that. A car is parked at 1:00 pm and then picked up at 6:45 pm. How much is owed for parking?
- 7) The length, width, and height of a rectangular prism are 12 cm 3 cm, and 6 cm respectively, what is the surface area of the prism?
- 8) $3^3 \times 9^3 = 3^?$
- 9) The price of a soda at the local store went from \$1.25 to \$1.50. What percent increase is this?
- 10) $\sqrt{110}$ is between what two integers?

Show your work and/or explain your thinking for each problem.

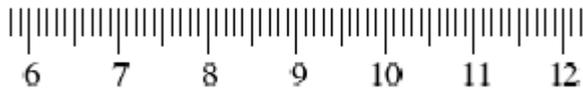
Set 15

- 1) A map uses a scale of 1 cm = 3.5 miles. If two cities are 437.5 miles apart, how far apart should they be on the map?
- 2) The median home price in a city went from \$250,000.00 to \$275,000.00. What percent increase is this?
- 3) The students at Gauss Middle School were asked what their favorite type of food is. 47% said pizza. There are 1,258 students at Gauss Middle School. About how many said their favorite type of food is pizza?
- 4) Which metric unit (kiloliter, liter, and milliliter) would you use to measure each of the following?
 - Gasoline in a cars tank
 - The amount of water behind Hoover Dam
 - Sugar used to make 6 dozen sugar cookies
 - Vanilla used to make two dozen cookies
- 5) The mean average age of a family of 5 is 15 and the median age is 12. What are two possible sets of ages that satisfy these conditions?
- 6) The mean of five numbers is 12. When a sixth number is added the new mean is 15. What was the sixth number?
- 7) The Super Sweet Candy Company puts red, white, and blue candies in their Patriotic blend. 20% of the candies are red, and $\frac{11}{20}$ are blue. What fraction of the Patriotic blend is white?
- 8) A chocolate chip cookie recipe calls for 550 mL (milliliter) of flour. Is this more or less than a liter of flour?
- 9) The same cookie recipe calls for 175 mL (milliliter) of sugar. How many centiliters is this?
- 10) Liquid soap comes in two sizes. One container is 1.5 liters and the other is 225 milliliters. Which is smaller?

Show your work and/or explain your thinking for each problem.

Set 16

- 1) Brenda has four books in her backpack. Which amount best describes the mass of the books and her backpack combined?
80 grams 8 kilograms 80 kilograms
- 2) Four umbrella stickers and a metric ruler are shown. About how many centimeters long would 20 stickers be if four are the length shown?



- 3) 1 cup is about 250 mL. About how many mL are in 6.5 cups?
- 4) The Super Fresh water bottling company can fill two-hundred **20** ounce bottles of water every hour. How many gallons of water is that during an eight hour shift?
- 5) Which would be the most appropriate unit of measure to determine the area of the athletic field at your school?
square inches square feet square yards square miles
- 6) What are the area and the perimeter of the rectangle shown?



- 7) Light travels at the speed of 186,282 miles per second, and the Sun is 93 million miles from the Earth. How many seconds does it take light to reach the Earth from the Sun?
- 8) Determine the area and the circumference of a circle given a radius of 3 feet. Use $\pi = 3.14$.
- 9) Margie telephoned Sam and asked him if $5 + 7 \times 9$ was 108. Sam said no, the answer is 68. Who is correct? Explain your reasoning.
- 10) Margie telephoned Sam again. She had been taught that to simplify the expression $5(7 + 10)$ you had to add the two numbers inside the grouping symbol first and then add. Margie's friend Maria had told her that it was okay to do $5(7) + 5(10)$. Who is correct? Explain your reasoning.

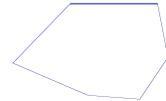
Show your work and/or explain your thinking for each problem.

Set 17

- 1) At right is part of a multiplication chart. Find a set of 9 numbers, arranged in a square, that have a mean of 1 in the chart.

1	2	3	4	5	6	7
2	4	6	8	10	12	14
3	6	9	12	15	18	21
4	8	12	16	20	24	28
5	10	15	20	25	30	35
6	12	18	24	30	36	42
7	14	21	28	35	42	49

- 2) The multiplication chart has many patterns. Find at least five patterns then **clearly and completely** describe them.
- 3) During a 15 minute workout on a stairclimber Suzanne noticed she had burned 125 calories. If this continues and she stays on the stair climber for a total of 1.5 hours how many calories will she burn?
- 4) A bus can hold 60 students. How many busses will it take to transport 450 students?
- 5) Peggy weighed $135\frac{1}{2}$ pounds before softball season started. After it was over she had dropped to $123\frac{7}{8}$ pounds. How much weight did Peggy lose during softball season?
- 6) Make and record at least 5 observations about the irregular polygon at right?



- 7) Jonas borrows \$10 from his sister, \$7 from his cousin, and \$15 from his mother. How much money does Jonas owe?
- 8) A soup company is designing a rectangular box to hold 48 cans of soup. One design they are considering is a box that is 6 cans wide by 8 cans long by 1 can tall. Come up with at least 3 **different** boxes they could design.
- 9) What is the 11th square number?
- 10) What is the surface area of a cube with a volume of 343 cubic centimeters?

Show your work and/or explain your thinking for each problem.

Set 18

- 1) Morgan is playing a card game with his friends using a standard deck of playing cards. The rules are as follows:
- **Face cards are worth 10 points**
 - **Aces are worth 1 point**
 - **2-10 are worth their value**
 - **Black cards are positive and red cards are negative**
 - **The cards are dealt and the values added to determine a score. Low score wins.**

Morgan was dealt a queen of spades, a 5 of hearts, and an 8 of diamonds.

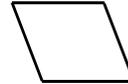
Write an expression that matches the hand Morgan was dealt and determine his score for the hand

- 2) Morgan's friend was dealt a 10 of diamonds, a 10 of spades, and a jack of hearts. Write an expression for Morgan's friend's hand and determine his score. Who has the low score, Morgan or his friend?

- 3) What type of quadrilateral has **exactly** one pair of parallel sides?

- 4) How many pairs of parallel sides does a regular hexagon have?

- 5) The parallelogram shown has one angle measuring 109° . What are the measures of the other three angles?



- 6) Gianni has 35 coins in pennies, nickels, dimes, and quarters. He has 3 times as many dimes as nickels and 4 times as many quarters as dimes. Gianni has \$6.73 in all. How many of each coin does he have?

- 7) Marta has been busy making and spending money. She made \$15 dollars babysitting, and then spent \$7 for lunch. She spent \$3 more renting a movie and then made \$9 doing chores. Marta spent \$5 more, made \$3, and then spent \$20 at the store. Did Marta need to borrow money to make all of her purchases?

- 8) Steve spent half of his money on lunch. Then he spent half of the money that remained on a movie. He gave half of what he had left to his younger brother and still had \$2.50. How much money did Steve have to begin with?

- 9) You could simplify the following expression in more than one way. Explain how you would do it. Which property(s) are you using?

$$-6 + 7 + (-24) + 10 + 13 + (-20)$$

Show your work and/or explain your thinking for each problem.

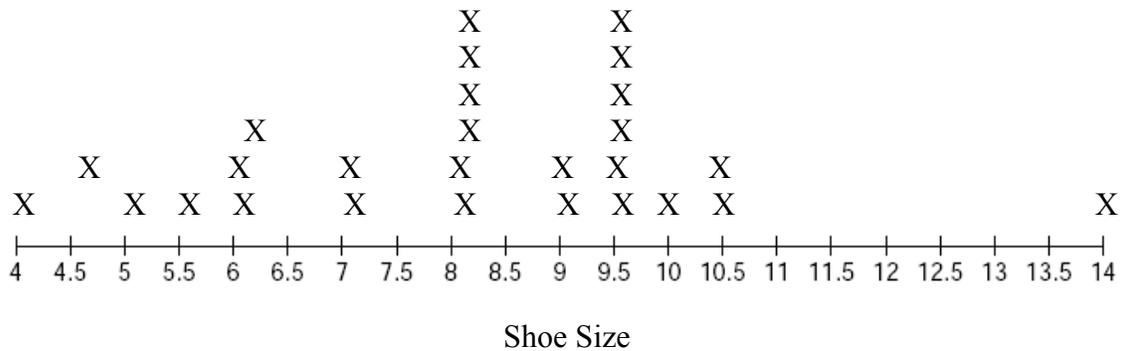
Set 18 continued

10) Mr. Gallagher's 7th grade students made the following line plot of their shoe sizes.

Use the line plot to answer the following questions:

- What is the mode of the shoe sizes?
- What is the median shoe size?
- Do any of the pieces of data appear to be an outlier?
- What would you say is the "average" shoe size of the students? Explain your reasoning.

Shoe Sizes of Students in Mr. Gallagher's Fifth Period Class



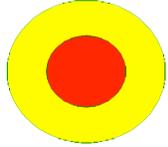
Show your work and/or explain your thinking for each problem.

Set 19

- 1) The tallest building in the world is the Taipei 101 in Taipei, Taiwan. The Taipei 101 was built in 2004. It has 101 stories and is 1667 feet tall. What is the mean average height of each floor in feet? Round your answer to the nearest tenth of a foot.
- 2) The tallest building in the United States is the Sears Tower in Chicago, Illinois. The Sears Tower was built in 1974. It has 110 stories and is 1450 feet tall. What is the mean average height of each floor in feet? Round your answer to the tenths place.
- 3) The Empire State Building in New York City is the 9th tallest building in the world. It was built in 1931 and is 380 meters in height. Approximately how many feet are there in 380 meters?
- 4) On a clear day visitors to the top of the Empire State Building can see approximately 63 miles in every direction. What is the area of the region that can be seen from the top of the Empire State Building? Use $\pi = 3.14$.
- 5) There are several new skyscrapers planned or under construction in the United States. One is the Trump International Hotel and Tower in Chicago, Illinois. It is under construction and due to open in 2008. The Trump International is 356.9 meters from basement to roof and 415.1 meters from basement to the top of its spire. How tall is the spire alone?
- 6) A proposed Chicago skyscraper is the Chicago Spire. If it is built it will surpass the Taipei 101 in height. It will have 81,470 square meters of floor space on 150 floors. What is the mean average area, in square meters, of each floor? Round your answer to the nearest tenth of a square meter.
- 7) The proposed Chicago Spire will have 1300 units (rooms) for offices, hotel rooms, and residences. What is the mean average number of square meters for each of the 1300 units given the total floor space of 81,470 square meters? Round your answer to the nearest tenth of a square meter.
- 8) The estimated value of the Chicago Spire is \$609,600,000.00. What will the average cost per unit (room) be? Round your answer to the nearest hundred thousand dollars. Round to the nearest penny.
- 9) Ladonna is making a model of the Sears Tower for math class. She wants to use a scale of 1 inch = 5 feet. How tall would her model tower need to be given that the Sears Tower is 1450 feet tall? Do you think Ladonna's scale is practical? Explain your reasoning.
- 10) Orianna suggests that Ladonna might want to use a scale of 1 in = 10 feet for her model. Do you think this scale is practical? What scale would you suggest for Ladonna? Explain your reasoning.

Show your work and/or explain your thinking for each problem.

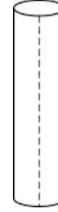
Set 20

- 1) Kathleen wants to build a swimming pool in her backyard. The pool she is hoping to build is in the shape of a rectangular prism. It is 50 feet long by 20 feet wide by 4 feet deep. What is the volume of the pool?
- 2) Kathleen is concerned about the water shortage in her area and decides to research how much water it will take to fill her pool before she builds it. She does her research and finds out that 1 cubic foot requires approximately 7.418 gallons of water to fill. How many gallons of water will it take Kathleen to fill her pool? Use the dimensions given in question 3.
- 3) Kathleen's neighbor Jane decides to put a spa in her backyard. The spa will be circular with a diameter of 6 feet and a depth of 3 feet. What is the volume of Jane's spa? $V = \pi r^2$
- 4) Jane wants to build a deck of concrete around her spa. She wants to concrete to go all of the way around the spa and be 3 feet wide. What will be the area of the spa and the concrete deck combined?

- 5) The students in Ms. Prime's math class ask her what her house number is. She replies with the following riddle. "If you divide my house number by 2, 3, 4, 5, or 6 you will get a remainder of 1. If you divide it by 11 there will be no remainder. It is the smallest number with these characteristics." What is Ms. Prime's house number?
- 6) A gram is about the size of one raisin. A dekagram is 10 grams. Estimate number of dekagrams in a new pencil.
- 7) There are 8 male students to every 7 female students at Charleston Middle School. There are 1350 students in all. How many students are **female**?
- 8) Which of the following expressions does not belong with the other three? Explain your reasoning. -6 6 $|-6|$ $|6|$
- 9) The local weather man predicts that the temperature will change by 20° tomorrow. What could this mean? Give an example.
- 10) A number squared and then multiplied by its cube is 243. What is the number?

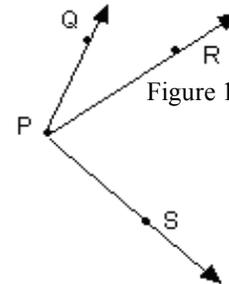
Show your work and/or explain your thinking for each problem.

Set 21

- 1) What is the surface area of the cylinder shown given the radius is 2 meters and the height is 10 meters? Use $\pi = 3.14$.
- 2) What is the volume of the cylinder from problem 1?
- 3) A circle is inscribed in a square as shown. The side of the square measures 4 feet. What is the area of the shaded region? Use $\pi = 3.14$.



- 4) Rounded to the nearest tenth $4567 \cdot 0.001 =$
- 5) The perimeter of an equilateral triangle is twice the perimeter of a square with an area of 36. What is the side length of the equilateral triangle?



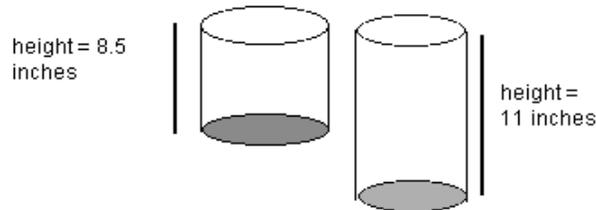
- 6) In Figure 1 estimate the measure of angle QPR.
- 7) In Figure 1 is angle RPS acute, right, or obtuse?
- 8) Ruth's bank pays her 4% simple interest on her savings account. Ruth has \$300.00 in the bank. How much interest will the bank owe her at the end of 6 months?
- 9) The sale price of a pair of jeans is \$45.00. The jeans have been discounted 25%. What was the **original** price of the jeans?
- 10) Classify the triangle shown below based on its side length and angles.



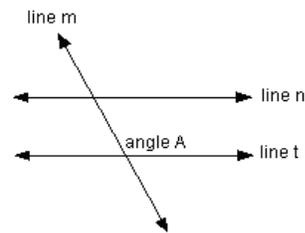
Show your work and/or explain your thinking for each problem.

Set 22

- 1) The Phoenix Movie Theater is creating a new popcorn container. They are trying to decide which of two cylinders would hold more popcorn. Both of the cylinders are made out of a standard sheet of paper whose dimensions are 8.5 inches by 11 inches. One is rolled the long way so that the height is 11 inches. The other is rolled the shorter way so that the height is 8.5 inches. Which holds more or are they the same? Explain your reasoning.



- 2) The hands of a clock show exactly 3:00. What is the angle between the two hands?
- 3) Two numbers are in the ratio of 2 to 3. Their difference is 35. What are the two numbers?
- 4) Mr. Guinn's car can go 570 miles on 15 gallons of gas. How many miles per gallon does the car get?
- 5) The diameter of the Earth is 12,756.3 kilometers. How many meters is this?
- 6) The diameter of the Earth is 12,756.3 kilometers. What is its circumference to the nearest kilometer? Use $\pi = 3.14$.
- 7) What is the sum of the first 10 even numbers?
- 8) Given that line n is parallel to line t and the measure of angle A is 125° . How many other angles in the diagram have a measure of 125° ? Justify your thinking.



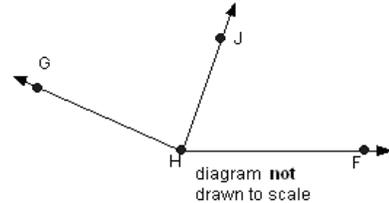
- 9) Two angles are complementary. One angle measures 25° . What is the measure of the other angle?
- 10) A regular hexagon has a perimeter of 48 cm. What is the length of each side?

Show your work and/or explain your thinking for each problem.

Set 23

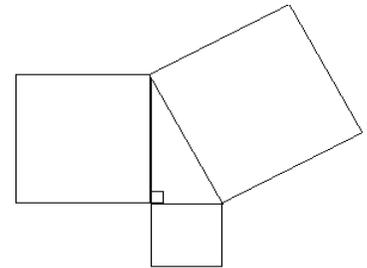
- 1) A scalene triangle has side lengths that are prime numbers. Its perimeter is also a prime number. What is the smallest possible perimeter that meets these conditions?
- 2) The length and width of a rectangular picture with dimensions 4 inches by 6 inches are each doubled. What is the area of the new picture?

- 3) An angle bisector is a ray that divides a larger angle into two congruent (equal) angles. Given $m\angle GHF = 150^\circ$ is bisected by ray HJ . What are the measures of $\angle GHJ$ and $\angle JHF$?



- 4) A square has an area of 144 square inches. What is the length of the side of the square?
- 5) A square has an area of 90. Between what two integers is the length of the side of the square?

- 6) The Pythagorean Theorem is used on with right triangles. The figure shown is a proof of the Pythagorean Theorem which says that the sum of the areas of the squares on the two legs of a right triangle is equal to the area of the square on the hypotenuse. If the legs of the right triangle shown are 1 cm and 2 cm in length. What is the area of the square on the hypotenuse?



- 7) What if the area of the square on the hypotenuse is 100 square units and the area of one of the squares on the legs is 36 square units? What is the area of the square on the other leg?
- 8) The area of the square on the hypotenuse is 25. What is the length of the hypotenuse?
- 9) Two square numbers have a sum of 100. What are they?
- 10) The central angle of a circle has a measure of 45° . What fractional part of the circle is this?

Show your work and/or explain your thinking for each problem.

Set 24

1) The cost of a football, including 7% tax, is \$26.75. What was the cost of the football without the tax?

2) The distributive property says that multiplication is distributive over addition and subtraction. $5(a + b) = 5a + 5b$ and $5(a - b) = 5a - 5b$
On the following problems which do **you** think would be easier and why, simplifying what is **inside** the parenthesis first then multiply, or using the **distributive** property? Explain your reasoning.

$12(8 - 2)$ $9(100 + 8)$ $11(15 - 8)$

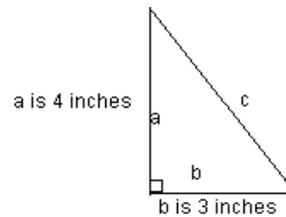
3) A homeowner is planning a garden composed of a square with two semicircles on each side. What is the area of the garden as shown? Use $\pi = 3.14$.



side length of square = 10 meters

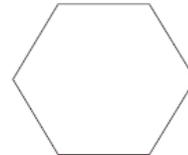
4) Tony's farm is in the shape of a square. It covers 64 square kilometers. What is the length of one side in kilometers?

5) What is the length of the hypotenuse, c , in the right triangle shown?



6) A pizza cost \$15.00 after a 20% increase. What was the cost of the pizza before the 20% increase?

7) A regular hexagon can be cut into two congruent isosceles trapezoids in how many different ways. Use the figure provided to draw all possible ways.



8) The area of a lawn is 15 square yards. How many square feet is this?

9) Write the following ratios in simplest form

5 days to 1 week 2 feet to 1 yard 6 pies to 20 people

10) A trapezoid has a height of 8.5 cm and base lengths of 10 cm and 12 cm. What is the area of the trapezoid?

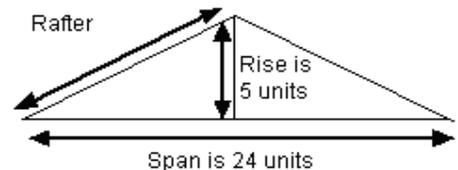
Show your work and/or explain your thinking for each problem.

Set 25

- 1) An airplane flies due north 300 kilometers before turning due east 400 kilometers. The pilot wants to fly back to where he started from. What is the shortest distance back to his starting point?
- 2) Two bicyclists travel 12 kilometers due west before turning due south and traveling another 5 kilometers. What is the **shortest** distance they must travel to get back to their starting point?
- 3) The sides of a triangle are 7 units, 8 units, and 10 units. Is it a right triangle?
- 4) The sum of two whole numbers is 7 times larger than their difference. What are the two whole numbers?
- 5) Pythagorean Triples are side lengths of right triangles that are whole numbers. 3, 4, 5 is the most famous Pythagorean Triple. $3^2 + 4^2 = 5^2$
Fill in the table provided with five more Pythagorean Triples. What do you notice?

Leg	Leg	Hypotenuse
3	4	5
6	8	?
9	12	?
12	?	15
?	24	30
75	100	?

- 6) Rafters support the roof of a house. In many homes the rafters are made of wood and the builders must cut them to size. The Pythagorean Theorem can be used to determine the length of a rafter. Use $a^2 + b^2 = c^2$, where a represents the rise and b represents the span to determine the length of the rafter.

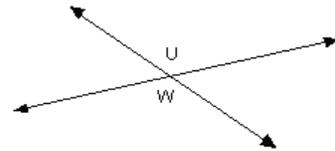


- 7) Using the information from problem 6, if the span is 30 feet and the rise is 8 feet. What is the length of the rafter? Describe the differences between the appearances of the two roofs.
- 8) Fred has a collection of quarters and nickels worth \$2.50. The ratio of nickels to quarters is 5:1. How many of each coin does Fred have?
- 9) A shipping box is in the shape of a rectangular prism has dimensions of $5\frac{1}{8}$ feet by $3\frac{3}{4}$ feet by 7.5 feet. What is the volume of the box?
- 10) What is 125% of 60?

Show your work and/or explain your thinking for each problem.

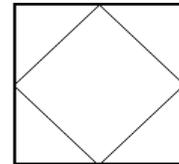
Set 26

- 1) In the diagram the $m\angle U = 120^\circ$. What is the measure of $\angle W$ and why?



- 2) A clothing designer is using a scale of 1 cm = 1 foot. The shirt he is designing is going to be 30 inches in length. How long should it be in the drawing?

- 3) A square is inscribed in a larger square as shown. The vertices of the smaller square are touching at the midpoint the sides of the larger square. Given that the side lengths of larger square are 12 units in length what is the area of the smaller square?



of the

- 4) Marguerite is planning on tiling her kitchen floor. The room is 12.25 feet by 23.5 feet. The square tile she is using is 12 inches on each side. What is the minimum number of square tile she will need to cover her floor?

The nutrition label for a candy bar is shown at right. Use the information from the label to answer questions 5 through 10.

- 5) What is the weight in grams of the candy bar?
- 6) How many grams are in half a serving?
- 7) Rounded to the nearest tenth how many calories are there in one gram?
- 8) What is the ratio of grams of fat to grams of protein in simplest form?
- 9) The label says that 5 mg of cholesterol is 2% of the recommended daily allowance. How many **total** grams of cholesterol are recommended daily?
- 10) The label says that 4 grams of protein is 6% of the recommended daily allowance. Approximately how many **total** grams of protein are recommended daily?

Serving Size: 1 bar • 2.07 oz • 58.7g		
Amount Per Serving		
Calories 280	Calories from Fat 126	
	% DV	
Total Fat 14g	22%	
Saturated Fat 5g	25%	
Cholesterol 5mg	2%	
Sodium 140mg	6%	
Total Carbohydrate 35g	12%	
Dietary Fiber 1g	4%	
Sugars 30g		
Protein 4g	6%	
Vitamin A 0%	•	Vitamin C 0%
Calcium 4%	•	Iron 2%
Unofficial Pts: 7		
DietFacts.com		

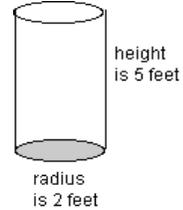
Percent of Calories from:
Fat-45% Carb-50% Protein-5.7%
(Total may exceed 100% due to rounding)

Show your work and/or explain your thinking for each problem.

Set 27

- 1) What is the sum of the interior angles of all octagons?
- 2) A solid cube with a side length of 5 inches costs \$43.75 to build. What would a cube, made of the same material, with a side length of 6 inches cost?
- 3) A picture that measures 12 cm by 18 cm is enlarged to four times its **area**. What are the new dimensions of the picture?

- 4) What is the surface area of the cylinder shown? Leave your answer in terms of π .

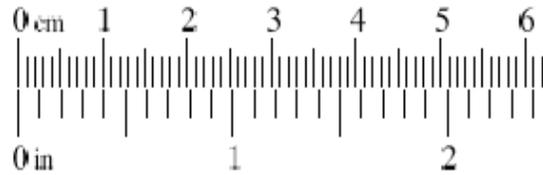


- 5) The planetarium at the Community College seats 360 people. One evening 306 stargazers showed up at the planetarium. What percent of the seats were filled?
- 6) Plato's Pizza makes a super special round pizza loaded with cheese and pepperoni. The pizza has a diameter of 16" and cost \$15.99. What is the price per square inch of Plato's special round pizza? Round your answer to the nearest penny.
- 7) Tara took a survey of her classmates to determine their favorite type of music. She surveyed 40 students and 28 of the said they liked rock best. What percent of the students surveyed liked rock best?
- 8) Tara has to take the results of her music survey and create a circle graph to display the data. Using the information from question 7, what angle measure would she use to show what percent of the students like rock best?
- 9) On the same survey 4 students said they like classical music best. What percent of the students surveyed liked classical music best? What angle measure would Tara use to show what percent of the students like classical music best?
- 10) One section of Tara's music graph has an angle measure of 18° . This section represents the percent of students who liked country music best. What percent of the students surveyed liked country music best?

Show your work and/or explain your thinking for each problem.

Set 28

- 1) Draw an arrow to indicate where $1\frac{13}{16}$ ” would be on the ruler shown.



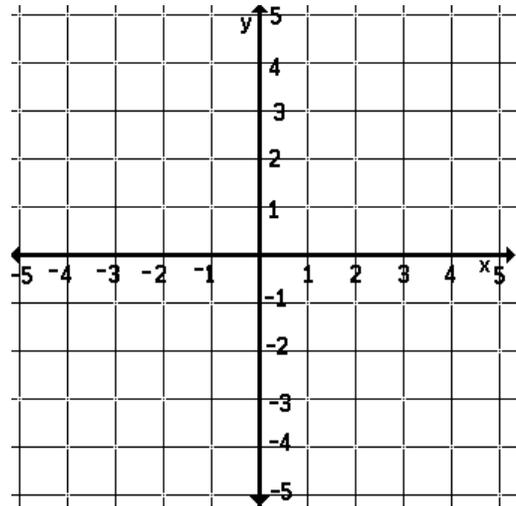
- 2) What is the measure of each of the angles of a regular six sided polygon?
- 3) The interior angles of a regular polygon **each** have a measure of 144° . How many sides does the polygon have?
- 4) Perry buys a rectangular 4 foot by 6 foot piece of plywood. He find out it is too big and cuts each of the dimensions in half. Determine the area of the smaller piece of plywood and compare it to the area of the original piece.
- 5) Shade 62.5% of the figure below.
- | | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | | | | | |
|--|--|--|--|--|--|--|--|
- 6) The temperature outside is dropping 3° per hour. If the temperature is 14° at 3 pm, what will it be at midnight?
- 7) A rectangle has vertices at the following coordinates: (-1, 1), (-1, 3), (-4, 1), (-4, 3)
The rectangle is translated 5 units to the right. What will the new coordinates be?
- 8) A rectangle has vertices at the following coordinates: (-1, 1), (-1, 3), (-4, 1), (-4, 3)
The rectangle is reflected across the **x-axis**,
What are the coordinates of the reflected rectangle?
- 9) A lawn sprinkler sprays water 5 ft in every direction as it rotates. What is the area of the sprinkled lawn? Use $\pi = 3.14$.
- 10) I am a two digit prime number less than 50. If you square me and add the third square number the result is 178. What number am I?

Show your work and/or explain your thinking for each problem.

Set 29

Use the coordinate plane grid below to help you answer the next **four** questions.

- 1) The vertices of a triangle are located at $(4, 0)$, $(4, 4)$, and $(1, 0)$. What are the lengths of the sides of the triangle?
- 2) The triangle described in problem 1 is reflected across the **y-axis**. What are the coordinates of the reflected triangle?
- 3) The triangle described in problem 1 translated 2 units down and 2 units to the left. What are the coordinates of the rotated triangle?
- 4) The triangle described in problem 1 is a scalene right triangle. What is the area of the triangle?



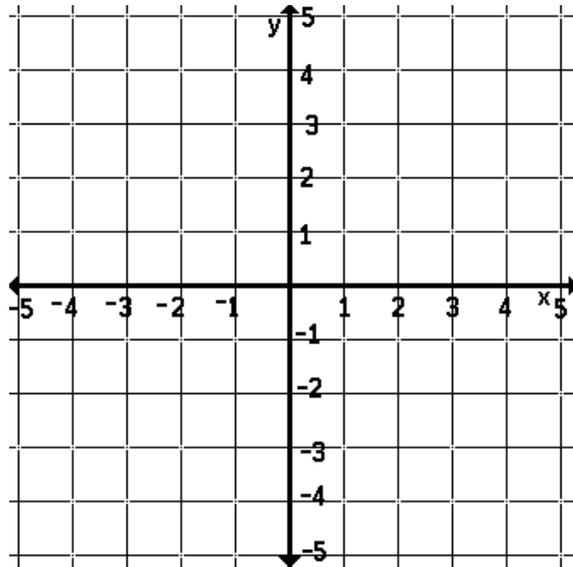
- 5) Mrs. Monica drove 320 miles in 6 hours. At that rate how long will it take her to drive 1040 miles? Express your answer in hours and minutes.
- 6) Mr. Monica drove 340 miles in 6 hours. At this rate how long will it take him to drive 960 miles? If he leaves the house at 7:45 am, when will he arrive at his destination?
- 7) Fast Rental Car Company charges \$50.00 per day plus \$0.15 per mile to rent a car. Clinton needs the car for 3 days and plans to make a trip of 850 miles round trip. How much will it cost Clinton to rent from Fast Rental Car Company?
- 8) What was the median high temperature during a week when the daily high temperatures were 75, 88, 80, 95, 79, 88, and 92?
- 9) The 7 members of the Smith family recorded their TV watching times. They discovered that their mean TV watching time is 6 hours a week. In addition, the median is 7 hours and the mode is 9 hours. Create a set of data that meets these conditions.
- 10) The Smith families neighbors decided to record their TV watching times. There are 5 people in the family. Their mean TV watching time is 4 hours, the median is 3 and there was no mode. Create a set of data that meets these conditions.

Show your work and/or explain your thinking for each problem.

Set 30

- 1) Complete the table and graph the resulting ordered pairs on the coordinate plane provided.

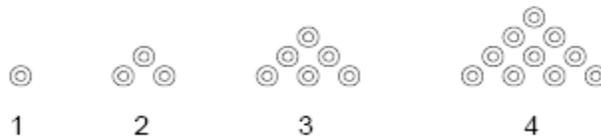
X	Y
-4	-1
-3	0
-2	1
-1	
0	



- 2) Two numbers have a sum of 4.25 and a product of 1. What are the two numbers?
- 3) What is the slope of a line through points (0, 0) and (1, 4)?

Use the pattern shown to answer the next **two** questions.

A number represented by the following pattern is called a triangular number. As shown the first triangular number is 1, the second triangular number is 3, the third triangular number is 6 and so on.

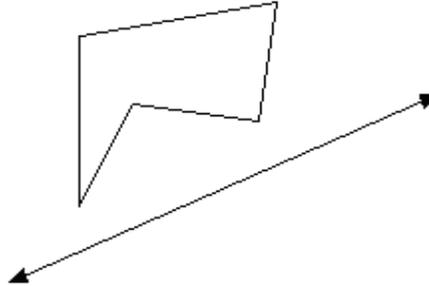


- 4) What is the 7th triangular number?
- 5) Create a coordinate graph that represents the first 6 triangular numbers. Make at least three observations about your graph.
- 6) Paulina is buying her first house. The price of the house is \$300,000.00. Paulina, who has been planning and saving her money for a long time, puts $33\frac{1}{3}\%$ down on the house. How much does she still owe on the house?

Show your work and/or explain your thinking for each problem.

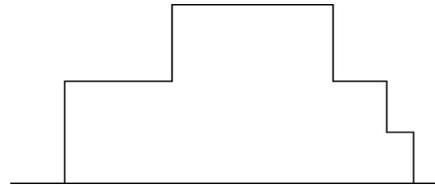
Set 30 continued

- 7) Sketch the figure shown below after it has been reflected across the line.

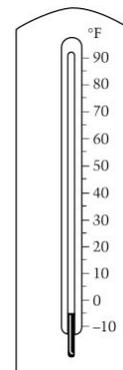


- 8) Marvi spend $\frac{1}{5}$ of her money on a pair of earrings and 25% of what remains on a matching bracelet. After she makes her purchases she has \$60.00 left. How much did she start with?

- 9) The figure shown below is one-half of a symmetric figure with its line of folding symmetry. Sketch the other half.



- 10) What temperature would be 10° below the temperature shown the thermometer?

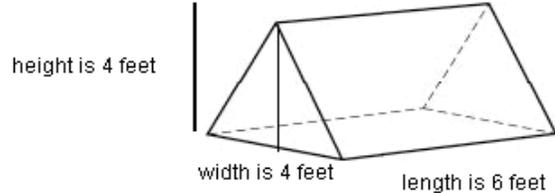


on

Show your work and/or explain your thinking for each problem.

Set 31

- 1) What is the probability of getting a prime number on one roll of a fair die? Express your answer as a fraction in simplest form.
- 2) What is the volume of the triangular prism shown?



- 3) How many different ways can the letters in the word math be arranged if they do **not** have to spell a word?
- 4) Create and complete a table like the one shown that lists **all** possible whole number dimensions for a rectangle with an area of 24 square units. Create a coordinate graph comparing the length to the width. For these purposes consider a 1 by 24 rectangle to be different than a 24 by 1 rectangle. Make at least three observations about your graph.
- 5) Find the unit price, to the nearest penny, for the following:

Length	width

6 apples for \$2.25 4 hotdogs for \$1.75 10 pounds of potatoes for \$2.99

- 6) Jeremy bought a quart of ice cream for \$2.56. Miriam bought a half-gallon of the same ice cream for \$5.44. How much did they each pay per ounce?
- 7) What is the probability of rolling a 12 as the sum of two fair dice? Express your answer as a fraction in simplest form.
- 8) What are the **odds** in favor of rolling a 12 as the sum of two fair dice? Express your answer in simplest form.
- 9) Nino does not understand why a positive number multiplied by a negative number gives a negative answer. Use the number line to help you explain to Nino why $3(-2)$ is a negative number.



- 10) Marge left the office at 4:40 pm. It took her 55 minutes to get home. What time did Marge get home?

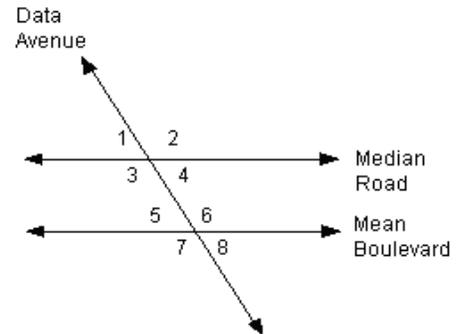
Show your work and/or explain your thinking for each problem.

Set 32

Use the pattern of square tile shown to answer the next **five** questions.



- 1) Sketch and describe **in** words the next figure in the pattern.
- 2) Create a table showing the number of squares it takes to build the first 10 figures. Make three observations about your graph.
- 3) Create a coordinate plane graph showing the number of tile it takes to build the first 10 figures.
- 4) Jeff is thinking of a figure that uses 81 square tiles. Which figure number is it? Explain your reasoning.
- 5) Two consecutive figures use 244 tiles. Which two consecutive figures are they?
- 6) Sherry's grade improved 10%. Her current grade is 88%. What was Sherry's grade before it improved?
- 7) The scale on a map is 1 cm=50 km. What is the actual distance if the distance on a map is 80 mm?
- 8) The figure shows three roads in the town of Statistics. Use the diagram to answer the following questions:
Name an angle that corresponds to angle 1.
Name an angle that is congruent to angle 4. Explain you thinking.
Name an angle that is an alternate angle to angle 2.
- 9) Use the figure from question 8 to answer the following. The $m\angle 1 = x^\circ$, and the $m\angle 3 = 2x^\circ$. What is the value of x ?



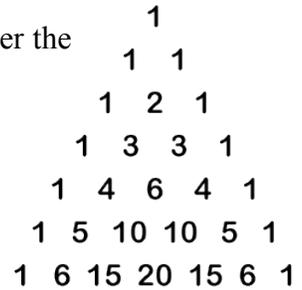
- 10) In how many ways can a committee of 3 people be chosen from a group of 5 people?

Show your work and/or explain your thinking for each problem.

Set 33

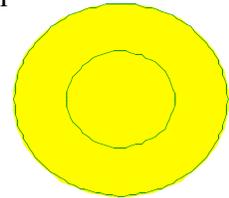
- 1) Two cards are selected at random from a standard deck of playing cards and **not** replaced. What is the probability that the first card is red and the second is a black Ace?

The triangle below is called Pascal's Triangle. Use the triangle to answer the next **three** questions.



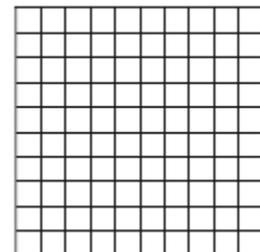
- 2) Complete the next three rows of the triangle.
- 3) The top row of Pascal's, the 1, is referred to as the zero row. Find the sum of the first 11 rows. Example: the sum of the zero row is 1, the sum of the first row is 2 and so on.
- 4) Find and clearly describe at least 5 **different** patterns in Pascal's Triangle.
- 5) Ms. Hawley's third period math class of 40 students scored 95% on a test. Her second period class of 32 students scored 92% on the same test. What is the combined average of the two classes? Round your answer to the nearest percent.

- 6) Ms. Hawley's sixth period class is designing dart boards for the school carnival. One of the dart boards is shown. The large circle has a radius of 2 feet. The small circle has a radius of 1 foot. Assuming that when a dart is thrown it lands on the board what is the probability that it will land in the smaller circle? Use $\pi = 3.14$.



- 7) What is the probability of getting two heads if you flip two coins one time?
- 8) How many different four digit numbers can be created if no digit can be used more than once?
- 9) How many different arrangements of two letters followed by two digits can be created if repeats are allowed?

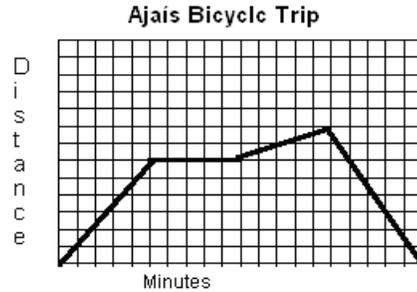
- 10) Shade $66\frac{2}{3}\%$ of the grid. Express the percent as a decimal and as a fraction in simplest form.



Show your work and/or explain your thinking for each problem.

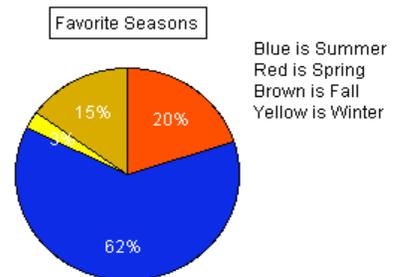
Set 34

- 1) The graph below shows Aja's Sunday afternoon bicycle ride. Create a story that explains the graph.



- 2) The expression $c + \$4.00$ could be used to determine the cost of a pair of shoes when it is increased by \$4.00. Write an expression to determine the following:
 John's height increased by 7 inches last year
 Paki discovered she had lost \$25.00
 Tabetha has 3 times as many quarters as her sister Ronnie
- 3) What is the name of the three-dimensional prism that has triangular bases?
- 4) Ms. Miles buys an antique lamp for \$98.75. She decides to sell it for \$125.00 at an online auction. The auction company charges \$6.50 to sell the lamp. How much profit will Ms. Miles make on the lamp?
- 5) I am a three digit square number less than 200. My square root is a prime number. If you multiply me by 2 and add (-17) the result will be another square number. What number am I?
- 6) Maureen and her father are attending a volleyball banquet. They get to choose what they want to eat from a small menu. They can choose soup or salad, three types of main dish, and three types of desert. How many different meals can be made with these choices?

- 7) The student's in Mr. Palma's class created the pie graph shown. There are 40 students in the class. How many students said fall was their favorite season?



- 8) Given $\left(\frac{1}{2}\right)^1 = \frac{1}{2}$ and $\left(\frac{1}{2}\right)^2 = \frac{1}{4}$, what is $\left(\frac{1}{2}\right)^5$?
- 9) A flight from Las Vegas, Nevada to Seattle, Washington leaves at 11:25 am and arrives at 2:05 pm. How long did the flight take? Express your answer in hours and minutes.
- 10) How many two digit whole numbers are multiples of both 2 and 3?

Show your work and/or explain your thinking for each problem.

Set 35

- 1) Margo threw four coins straight up in the air. What is the probability that three of the coins landed on heads? Express your answer in simplest form.
- 2) Discount City takes 10% off the ticketed price of every item. Amy bought a big-screen TV that had a ticketed price of \$1,000.00. At the register, the clerk deducted only 4%. He said he was lowering the discount to make up for the 6% sales tax on the item. Amy insisted that she was being ripped off and that the clerk should charge the 6% sales tax after the discount was applied. Do you agree or disagree with Amy? Explain your answer.

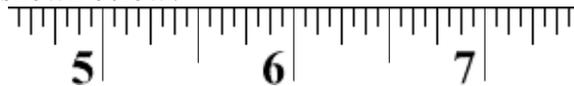
- 3) The table at right is an input-output table. A number is put in the left-hand side and a number pops out on the right hand side. Complete the table. If you put in a 10, what number would come out?

Input	Output
1	2
2	6
3	12
4	20
10	

- 4) Kenny can swim 20 meters in $1\frac{1}{4}$ minutes. How long will it take him to swim 200 metes at the same rate of speed?

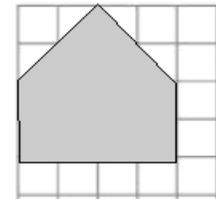


- 5) The **precision unit** of a measurement tool is the smallest unit on the tool. What is the precision unit of the ruler shown below?



- 6) Choose the most precise unit of measure: centimeters, meters, millimeters, or kilometers.

- 7) Caitlin created the dartboard shown for math class. A dart is thrown and hits the board. What is the probability it lands in the shaded region? Express your answer as a percent.

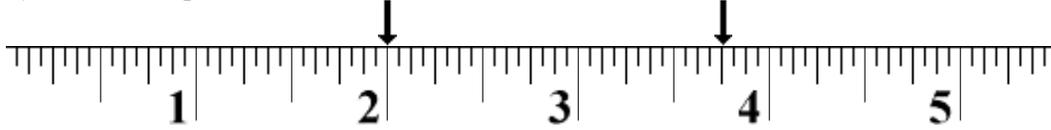


- 8) Use the dartboard from problem 7 to answer this question. What are the **odds** against the dart landing in the shaded region?
- 9) What is the probability of throwing a 5 or a 6 on one roll of a fair die?
- 10) A box with a square bottom and a volume of 2000 cubic centimeters is made by cutting 5cm squares from the corners of a square piece of cardboard and then turning up the sides. What are the dimensions of the piece of cardboard?

Show your work and/or explain your thinking for each problem.

Set 36

- 1) How far apart are the two arrows shown below?



- 2) At a sale Shiloh finds a coat that has been marked down from \$120.00 down to \$96.00. What percent of decrease is this?

- 3) Find the area of the shaded region rounded to the nearest square foot. The cutout at the end is semicircle. Use $\pi = 3.14$.



- 4) In how many different ways can the letters in the word school be re-arranged if they do **not** have to spell a word?

- 5) What is in the ones place of 8^{30} ?

- 6) The whole numbers are listed in order and placed in this arrangement. Each row has two more entries in it than the row above it. What is the first number in the row containing the integer 500?

			1	2			
			3	4	5	6	
		7	8	9	10	11	12
13	14	15	16	17	18	19	20

- 7) There are 6 basketball teams in a tournament. Each of the teams must play every other team twice. How many games are played altogether?

- 8) Trenton is flying from Reno, Nevada to Tucson, Arizona. The plane has a layover in Las Vegas, Nevada. The plane leaves Reno at 10:45 am and arrives in Las Vegas at 11:55 am. The plane leaves Las Vegas at 12:50 pm and arrives in Tucson at 3:05 pm. How much time did the plane spend in the air during the entire trip?

- 9) A line has a slope of $\frac{5}{2}$ and passes through the point $(-1, 3)$. Name two other points that are on the line.

- 10) The cylinder shown has a diameter of 20 cm and a height of 15 cm. If the diameter is doubled to 40 cm, how many times larger will the volume of the cylinder be?

