

Example

A shuttle operator charges a fare of \$10 to the airport and carries 300 people per day. The owner of the shuttle service estimates for every dollar increase in fare, he will lose 15 passengers. Find the most profitable fare for him to charge.

Ex 5

Whoops - no equation was given. Let's see how we can address

Cost x people = fare

$$10 \times 300 = \$3000$$

For every increase of \$1, he loses 15 people. Writing an

$$(10 + x)(300 - 15x) = \text{fare}$$

$$3000 + 150x - 15x^2 = \text{fare}$$

Using $-b/2a$, $b = 150$, $a = -15$, we have $-150/-30 = 5$. The x
So he should charge \$15.

If he increased the fare by \$5 to \$15, he would maximize his
our equation, we have

$$(10 + 5)(300 - 15(5)) = \text{fare}$$

$$15 (225) = \$3375$$

Knowing the math increased his income from fares from \$3000
\$375.00

that.

equation, we have

coordinate of the vertex.

profit. Substituting 5 into

to \$3,375. An increase of