A company makes and sells syringes. The following equation models their Profit as a function of the # of syringes made per hour:
$P(s) = -0.45s^2 + 360s - 51{,}500$

1. Find the company's maximum Profit.

$-0.45(400)^2 + 360(400) - 51{,}500 = \$20{,}500$

Answer this question second by replacing s with 400.

2. Find the number of syringes that should be made per hour in order to make this maximze Profit.

$s = \frac{-b}{2a} = \frac{-360}{2(-0.45)} = 400$ syringes

Answer this question first by finding the Line of Symmetry.

A company makes and sells syringes. The following equation models their Profit as a function of the # of syringes made per hour:
$P(s) = -0.45s^2 + 360s - 51{,}500$

3. How many syringes should they make per hour in order to break-even?

$0 = -.45s^2 + 360s - 51{,}500 \quad P = 0$

$b^2 - 4ac = 36{,}900$

$s = \frac{-360 \pm \sqrt{36{,}900}}{-.9}$

$s = 187, 614$

Making either 187 or 614 syringes per hour will allow the company to break even.

Hwk #14 Sec 5-8

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Due Tomorrow

Problems 8, 9, 21, 22, 31-33, 57-59

Find all Real solutions.

$2x^2 + 18 = 12$

$-18 \quad -18$

$\frac{2x^2}{2} = \frac{-6}{2}$

$\sqrt{x^2} = \sqrt{-3}$ → No Real Sol

Sec 5-6

Complex Numbers

Real Numbers

Rational #'s

Intergers

Whole #'s

Natural #'s

Irrational #'s

Imaginary Numbers

Ex:

7i

2 + 5i

Imaginary Numbers:

$$\sqrt{-1} = i$$

i is called the imaginary unit.

Simplify each.

1. $\sqrt{24}$

$= \sqrt{4 \cdot 6}$

$= \sqrt{4} \cdot \sqrt{6}$

$= 2\sqrt{6}$

2. $\sqrt{-24}$

$= \sqrt{-1 \cdot 4 \cdot 6}$

$= \sqrt{-1} \cdot \sqrt{4} \cdot \sqrt{6}$

$= 2i\sqrt{6}$