

1. Solve the equation by the method of your choice: $x^2 = 4x - 7$

By quadratic formula $\Rightarrow x^2 - 4x + 7 = 0$
 $a = 1$ $b = -4$ $c = 7$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(7)}}{2(1)}$$

$$= \frac{4 \pm \sqrt{16 - 28}}{2} = \frac{4 \pm \sqrt{-12}}{2}$$

$$= 2 \pm i\sqrt{3}$$

end point not included

2. Solve the inequality, and express in interval notation: $|2x + 1| < 5$

① $2x + 1 < 5$

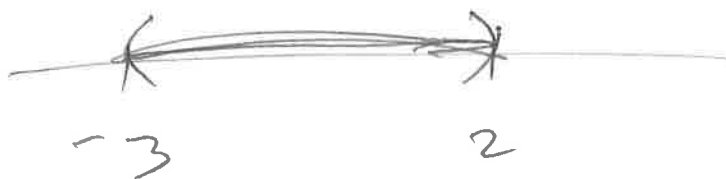
$$2x < 4$$

$$x < 2$$

② $2x + 1 > -5$

$$2x > -6$$

$$x > -3$$



$$(-3, 2)$$

The profit earned by selling tickets is described by the formula:

$$P(x) = -15x^2 + 600x - 60, \text{ where } \underline{x} \text{ is the } \underline{\text{ticket price}}$$

1) What is the price that produces the maximum profit?

$$x \rightarrow \text{price} \quad \text{Vertex}$$

$$x = \frac{-b}{2a} = \frac{-600}{2(-15)} = \frac{600}{30} = 20$$

2) What is the amount of the maximum profit?

profit at \$20 price

$$\begin{aligned} P(20) &= -15(20)^2 + 600(20) - 60 \\ &= -15(400) + 12000 - 60 \\ &= -6000 + 12000 - 60 \\ &= 6000 - 60 \\ &= \$5940 \end{aligned}$$