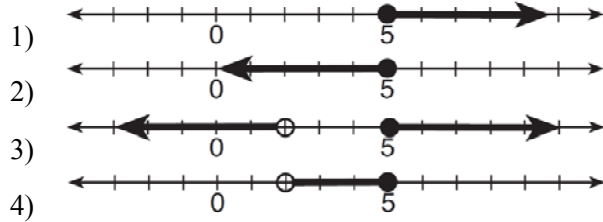


A2.A.23: Rational Inequalities: Solve rational equations and inequalities

- 1 Which graph represents the solution set of

$$\frac{x+16}{x-2} \leq 7?$$



- 2 The cost (C) of selling x calculators in a store is modeled by the equation $C = \frac{3,200,000}{x} + 60,000$. The store profit (P) for these sales is modeled by the equation $P = 500x$. What is the minimum number of calculators that have to be sold for profit to be greater than cost?

A2.A.23: Rational Inequalities: Solve rational equations and inequalities**Answer Section**

1 ANS: 3

$$\frac{x+16}{x-2} - \frac{7(x-2)}{x-2} \leq 0 \quad -6x+30=0 \quad x-2=0. \text{ Check points such that } x < 2, 2 < x < 5, \text{ and } x > 5. \text{ If } x = 1,$$

$$\frac{-6x+30}{x-2} \leq 0 \quad \begin{array}{l} -6x = -30 \\ x = 5 \end{array} \quad x = 2$$

$$\frac{-6(1)+30}{1-2} = \frac{24}{-1} = -24, \text{ which is less than } 0. \text{ If } x = 3, \frac{-6(3)+30}{3-2} = \frac{12}{1} = 12, \text{ which is greater than } 0. \text{ If } x = 6,$$

$$\frac{-6(6)+30}{6-2} = \frac{-6}{4} = -\frac{3}{2}, \text{ which is less than } 0.$$

REF: 011424a2

2 ANS:

$$\frac{3,200,000}{x} + 60,000 < 500x. \quad x - 160 < 0 \text{ and } x + 40 < 0. \quad 161$$

$$-500x + 60,000 + \frac{3,200,000}{x} < 0 \quad \begin{array}{l} x < 160 \text{ and } x < -40 \\ x < -40 \end{array}$$

$$x - 120 - \frac{6,400}{x} > 0 \quad \begin{array}{l} \text{or} \\ x - 160 > 0 \text{ and } x + 40 > 0 \end{array}$$

$$x^2 - 120x - 6400 > 0 \quad x > 160 \text{ and } x > -40$$

$$(x - 160)(x + 40) > 0 \quad x > 160$$

REF: 080227b