

SM2 5.5: Solving Quadratics by Factoring

Solve each equation using the zero-factor property.

1) $(5n + 7)(n + 7) = 0$
 $n = -\frac{7}{5}, n = -7$

2) $(a - 8)(a + 6) = 0$
 $a = 8, a = -6$

3) $(r - 6)(4r - 7) = 0$
 $r = 6, r = \frac{7}{4}$

4) $(x + 7)(5x - 8) = 0$
 $x = -7, x = \frac{8}{5}$

Solve each equation.

5) $x^2 + 6x - 7 = 0$
 $x = 1, x = -7$

6) $2r^2 + 7r + 6 = 0$
 $r = -\frac{3}{2}, r = -2$

7) $v^2 + 7v = 0$
 $v = 0, v = -7$

8) $5k^2 + 20k - 60 = 0$
 $k = -6, k = 2$

9) $0 = -35b^2 - 28b$
 $b = 0, b = -\frac{4}{5}$

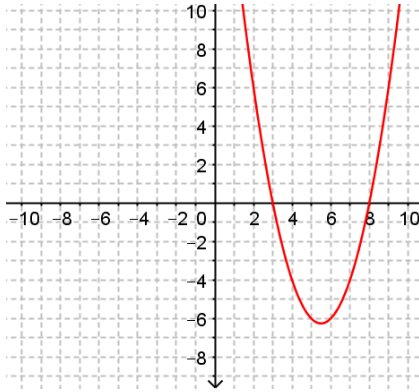
10) $x^2 - 16 = 0$
 $x = 4, x = -4$

11) $4v^2 - 2v = 2$
 $v = -\frac{1}{2}, v = 1$

12) $7n^2 - 16 = -24n$
 $n = -4, n = \frac{4}{7}$

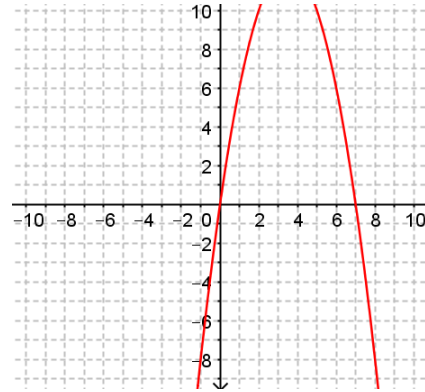
a) Find the real roots of each quadratic function. b) Then sketch the graph of each quadratic function and label the roots. c) Determine the positive and negative intervals.

13) $f(x) = x^2 - 11x + 24$
 $x = 3, x = 8$



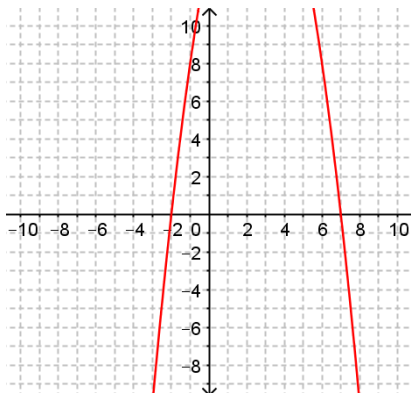
Positive: $(-\infty, 3)(8, \infty)$
 Negative: $(3, 8)$

14) $g(x) = -x^2 + 7x$
 $x = 0, x = 7$



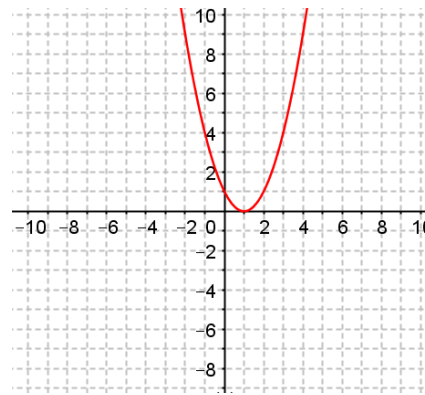
Positive: $(0, 7)$
 Negative: $(-\infty, 0)(7, \infty)$

15) $y = -x^2 + 5x + 14$
 $x = -2, x = 7$



Positive: $(-2, 7)$
 Negative: $(-\infty, -2)(7, \infty)$

16) $f(x) = x^2 - 2x + 1$
 $x = 1$



Positive: $(-\infty, 1)(1, \infty)$
 Negative: \emptyset

17) Which function has a shorter positive interval? $f(x)$

x	$f(x)$
-3	-10
-2	0
-1	6
0	8
1	6
2	0
3	-10

$$g(x) = -x^2 + 3x + 10$$

- 18) A soccer ball is kicked from the ground and travels a parabolic path modeled by $h(t) = -5t^2 + 20t$, where $h(t)$ is the height of the soccer ball in meters above the ground t seconds after being kicked. Assuming the ball lands on level ground, about how long is the ball in the air?

4 sec

- 19) The income in dollars for a school talent show is $I(p) = 100p - 5p^2$, where p is the ticket price. What ticket price(s) will result in an income of \$0?

$p = \$0, p = \20

- 20) A rectangular carpet has an area of $A(x) = x^2 + 6x - 16$ square feet. Find the width of the carpet if the length is $x + 8$ feet.

$x - 2$ ft

- 21) The height of a baseball in feet x seconds after it is thrown is given by $h(x) = -16x^2 + 32x + 5$. When will the ball be at a height of 21 feet?

1 sec

- 22) A rectangular porch has an area of 32 square feet. The length of the porch is 4 feet longer than the width. What is the width of the porch?

4 ft

- 23) As part of a science experiment, Carson designs and creates a cushioned egg carrier. He puts an egg inside it, and then drops it from a window that is 25 feet high to see whether his design can safely cushion the egg and keep it from breaking. The egg's height in feet x seconds after being dropped is given by $h(x) = 25 - 16x^2$. After how many seconds will the egg hit the ground?

$\frac{5}{4}$ sec