

Solve:  $w(2w + 3) = 0$

Solve:  $x^2 + 2x - 8 = 0$

$$(x+4)(x-2) = 0$$

$$x+4=0 \quad | \quad x-2=0$$

$$x=-4 \quad x=2$$

Solve:  $b^2 + 9b + 14 = 0$

$$(b+7)(b+2) = 0$$

$$b+7=0 \quad b+2=0$$

$$b=-7 \quad b=-2$$

Solve:  $2y^2 = 13y + 45$

$$2y^2 - 13y - 45 = 0$$

$$(2y^2 - 18y) + (5y - 45) = 0$$

$$2y(y-9) + 5(y-9) = 0$$

$$(2y+5)(y-9) = 0$$

Solve:  $3c^2 = 10c - 8$

$$3c^2 - 10c + 8 = 0$$

$$(3c^2 - 6c)(-4c + 8) = 0$$

$$3c(c-2) - 4(c-2) = 0$$

$$(3c-4)(c-2) = 0$$

Solve:  $5x^2 - 13x = 7x$

$$2y^2 = 13y + 45$$

$$-13y - 45$$

$$\frac{24}{-6 \cdot -4}$$

$$\frac{-90}{-9 \cdot 10}$$

$$-10 \cdot 8$$

$$\frac{-18 \cdot 5}{-18 \cdot 5}$$

$$2y+5=0$$

$$-5 \cdot -5$$

$$2y=-5$$

$$y = -\frac{5}{2}$$

$$y-9=0$$

$$y=9$$

$$3c-4=0 \quad c-2=0$$

$$3c=4 \quad c=2$$

$$c = \frac{4}{3}$$

$$4x^2 - 1 = 0$$

$$(2x+1)(2x-1) = 0$$

$$x^2 - 36 = 0$$

$$(x-6)(x+6) = 0$$

$$x^2 - 49 = 0$$

$$(x+7)(x-7) = 0$$

$$\text{Solve: } 144q^2 = 25$$

$$144q^2 - 25 = 0$$

$$(12q - 5)(12q + 5) = 0$$

$$12q - 5 = 0 \quad 12q + 5 = 0$$

$$\text{Solve: } 36x^2 = 121$$

$$36x^2 - 121 = 0$$

$$(6x - 11)(6x + 11) = 0$$

$$6x - 11 = 0 \quad 6x + 11 = 0$$

$$6x = 11 \quad 6x = -11$$

$$\text{Solve: } 2y^2 = 13y + 45$$

$$q = \pm \frac{5}{12}$$

$$\text{Solve: } (3x - 8)(x - 1) = 3x$$

$$\text{Solve: } (2m + 1)(m + 3) = 12m$$

$$\text{Solve: } (k + 1)(k - 1) = 8$$

Solve:  $8x^3 = 24x^2 - 18x$

Solve:  $16y^2 = 32y^3 + 2y$

Solve:  $4x^2 = 16x + 84$

Solve:  $18a^2 - 30 = -33a$

Find the product of two consecutive integers is 132. Find the integers.

The product of two consecutive integers is 240. Find the integers.

A multilevel driving range has three levels. Marco hits golf balls from the second level, which is 32 ft high. The height of a ball  $x$  seconds after Marco hits it is modeled by the function  $h(x) = -16x^2 + 16x + 32$ . When does the ball hit the ground?

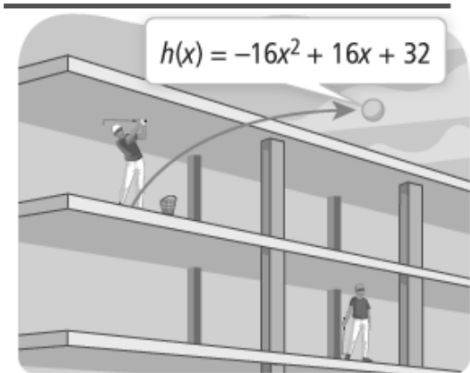
$$0 = \frac{-16x^2}{-16} + \frac{16x}{-16} + \frac{32}{-16}$$

$$0 = x^2 - x - 2$$

$$0 = (x-2)(x+1)$$

$$x-2=0 \quad x+1=0$$

$$\boxed{x=2} \quad x=-1$$



A baseball is thrown from the upper deck of a stadium, 128 ft above the ground. The function  $h(t) = -16t^2 + 32t + 128$  gives the height of the ball  $t$  seconds after it is thrown. How long will it take the ball to reach the ground?

$$\frac{0}{-16} = \frac{-16t^2}{-16} + \frac{32t}{-16} + \frac{128}{-16}$$

$$0 = t^2 - 2t - 8$$

$$(t-4)(t+2) = 0$$

$$t-4=0 \quad t+2=0$$

$$\textcircled{t=4} \quad t=-2$$



## Positive or Negative Intervals

Identify the interval(s) on which the function  $y = x^2 - 2x - 3$  is positive

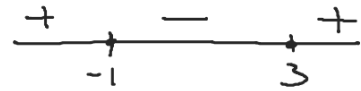
$$x^2 - 2x - 3 = 0$$

$$(x-3)(x+1) = 0$$

$$x-3=0 \quad x+1=0$$

$$x=3 \quad x=-1$$

$$(-\infty, -1) \cup (3, \infty)$$



$$x = -2$$

$$(-2)^2 - 2(-2) - 3$$

$$4 + 4 - 3$$
$$5$$

$$x = 4$$

$$4^2 - 2(4) - 3$$

$$16 - 8 - 3$$
$$5$$

$$x = 0$$

$$(0)^2 - 2(0) - 3$$

Identify the interval(s) on which the function  $y = x^2 - 4x - 21$  is negative

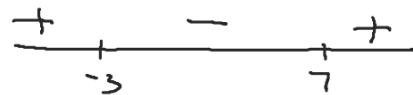
Find Zeros (x-intercepts)

$$x^2 - 4x - 21 = 0$$

$$(x-7)(x+3) = 0$$

$$x = 7 \quad x = -3$$

$(-3, 7)$



Let $x = -4$	Let $x = 0$	Let $x = 8$
$(-4)^2 - 4(-4) - 21$	$(0)^2 - 4(0) - 21$	$8^2 - 4(8) - 21$
$16 + 16 - 21$	$0 - 0 - 21$	$64 - 32 - 21$
$32 - 21$	$-21$	$32 - 21$
$11$		$11$