



**THIRD SPACE
LEARNING**

Quadratic Equations Worksheet

Algebra

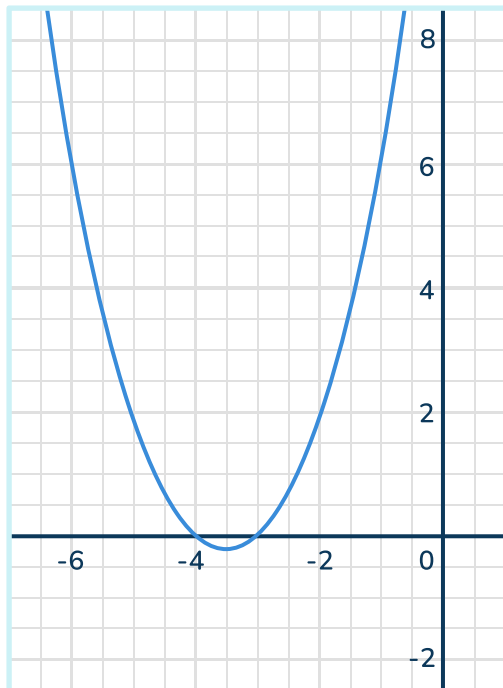
Grades 9 to 12

Skill Questions

Name:

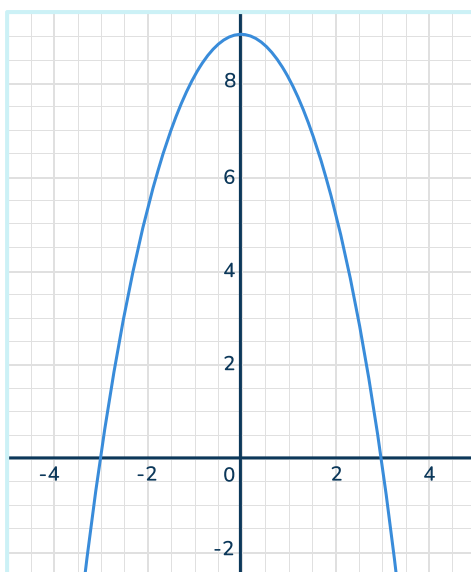
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- 1 Find the root(s) of the quadratic equation, $x^2 + 7x + 12 = 0$, which is graphed below.



Answer

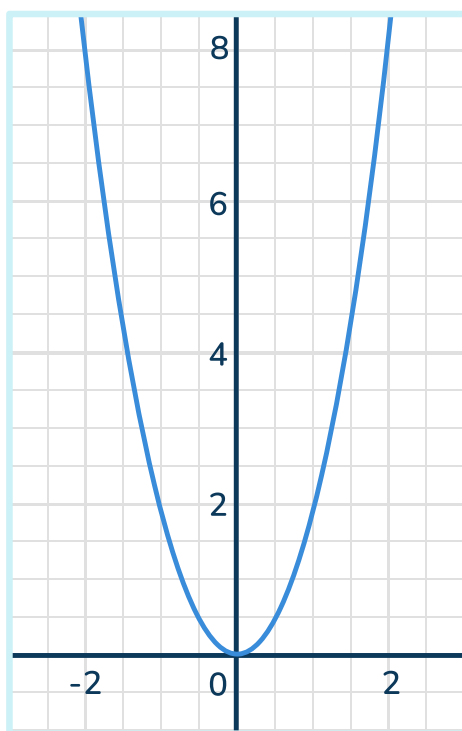
- 2 Find the root(s) of the quadratic equation, $-x^2 + 9 = 0$, which is graphed below.



Answer

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- 3 Find the solution(s) to the quadratic equation, $y = 2x^2$, which is graphed below.



Answer

- 4 Find the solution to the quadratic equation by factoring.

$$x^2 - x - 30 = 0$$

Answer

- 5 Find the solution to the quadratic equation by factoring.

$$x^2 + 7x + 15 = 5$$

Answer

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- 6 Find the solution to the quadratic equation by factoring.

$$2x^2 + x = 15$$

Answer

- 7 Find the solution to the quadratic equation by factoring.

$$-4x^2 - 8x - 3 = -3 - 5x^2$$

Answer

- 8 Solve the quadratic equation by factoring.

$$15p^2 - 4p = 3 - 8p$$

Answer

- 9 Solve the quadratic equation using the quadratic formula.

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

Answer

- 10 Solve the quadratic equation.

$$5x^2 - 44x + 110 = -40 + 11x$$

Answer

Applied Questions

- 11 The side of a square is $x + 1$ and the area is 121 units². Find the value of x .

Answer

- 12 Tommy made a 4ft by 5ft rug. He decides to increase both sides by the same amount so that it has an area of 56 ft². Find the amount he increased both sides by.

Answer

- 13 The product of two consecutive integers is 56. Find the numbers.

Answer

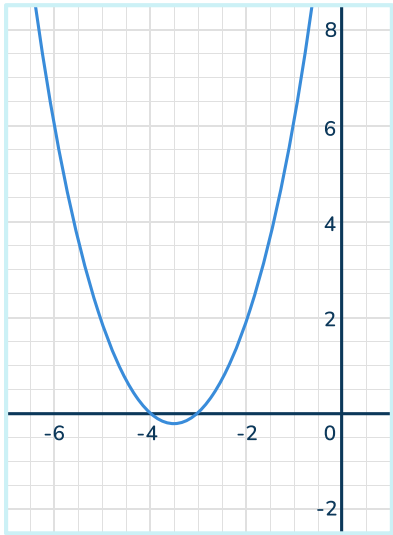
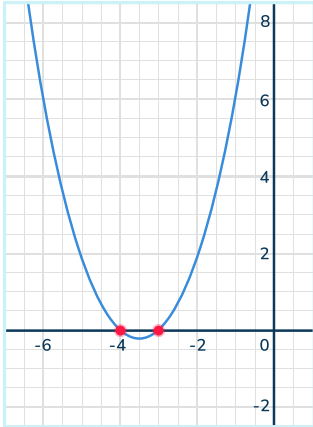
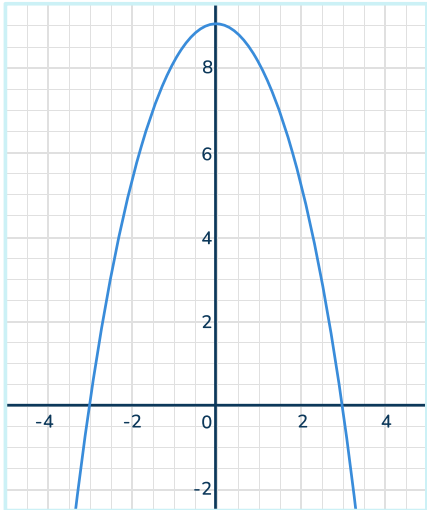
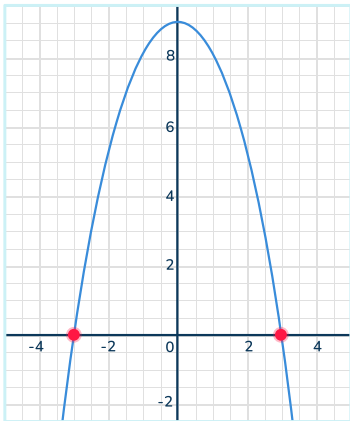
- 14 The product of two consecutive odd integers is 63. Find the numbers.

Answer

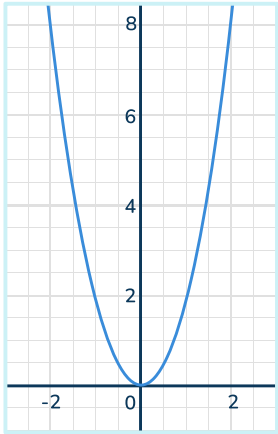
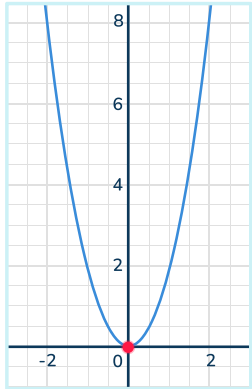
- 15 A ladder is resting against a wall. The top of the ladder touches the wall at a height of 12 feet. Find the distance from the wall to the bottom of the ladder if the length of the ladder is twice the distance from the bottom of the ladder to the wall.

Answer

Answers

Question number	Question	Answers	Standard
1	<p>Find the solution(s) of the quadratic equation, $y = x^2 + 7x + 12$, which is graphed below.</p> 	<p>The solutions to the quadratic equation are $x = -4$ and $x = -3$</p> <p>The solutions are the x-intercepts.</p> 	<p>HSA.REI.B.4b HSA.REI.B.4a</p>
2	<p>Find the solution(s) of the quadratic equation, $y = -x^2 + 9$, which is graphed below.</p> 	<p>The solutions to the quadratic equation are $x = 3$ and $x = -3$.</p> <p>The solutions are the x-intercepts.</p> 	<p>HSA.REI.B.4b HSA.REI.B.4a</p>

Quadratic Equations Worksheet | Grades 9 to 12 | Answers

Question number	Question	Answers	Standard
3	Find the solution(s) to the quadratic equation, $y = 2x^2$, which is graphed below. 	The solution to the quadratic is $x = 0$. The solution is the x -intercept. 	HSA.REI.B.4b HSA.REI.B.4a
4	Find the solution to the quadratic equation by factoring. $x^2 - x - 30 = 0$	$x^2 - x - 30 = 0$ $(x - 6)(x + 5) = 0$ $x - 6 = 0 \quad x + 5 = 0$ $x = 6 \quad x = -5$	HSA.SSE.B.3a
5	Find the solution to the quadratic equation by factoring. $x^2 + 7x + 15 = 5$	$x^2 + 7x + 15 = 5$ $x^2 + 7x + 10 = 0$ $(x + 2)(x + 5) = 0$ $x + 2 = 0 \quad x + 5 = 0$ $x = -2 \quad x = -5$	HSA.SSE.B.3a
6	Find the solution to the quadratic equation by factoring. $2x^2 + x = 15$	$2x^2 + x = 15$ $2x^2 + x - 15 = 0$ $(2x - 5)(x + 3) = 0$ $2x - 5 = 0 \quad x + 3 = 0$ $2x = 5 \quad x = -3$ $x = \frac{5}{2}$	HSA.SSE.B.3a
7	Find the solution to the quadratic equation by factoring. $-4x^2 - 8x - 3 = -3 - 5x^2$	$-4x^2 - 8x - 3 = -3 - 5x^2$ $x^2 - 8x = 0$ $x(x - 8) = 0$ $x = 0 \quad x - 8 = 0$ $x = 8$	HSA.SSE.B.3a

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Question number	Question	Answers	Standard
8	Solve the quadratic equation by factoring. $15p^2 - 4p = 3 - 8p$	$15p^2 - 4p = 3 - 8p$ $15p^2 + 4p - 3 = 0$ $(5p + 3)(3p - 1) = 0$ $5p + 3 = 0 \quad 3p - 1 = 0$ $5p = -3 \quad 3p = 1$ $p = -\frac{3}{5} \quad p = \frac{1}{3}$	HSA.SSE.B.3a
9	Solve the quadratic equation using the quadratic formula. $3x^2 - 2x - 2 = 0$	$a = 3 \quad b = -2 \quad c = -2$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(3)(-2)}}{2(3)}$ $x = \frac{2 \pm \sqrt{4 + 24}}{6}$ $x = \frac{2 \pm \sqrt{28}}{6}$ $x = \frac{2 + \sqrt{28}}{6} \approx 1.22$ $x = \frac{2 - \sqrt{28}}{6} \approx -0.54$	HSA.REI.B.4b
10	Solve the quadratic equation. $5x^2 - 44x + 110 = -40 + 11x$	$5x^2 - 44x + 110 = -40 + 11x$ $5x^2 - 55x + 150 = 0$ $5(x^2 - 11x + 30) = 0$ $x^2 - 11x + 30 = 0$ $(x - 5)(x - 6) = 0$ $x - 5 = 0 \quad x - 6 = 0$ $x = 5 \quad x = 6$	HSA.SSE.B.3a

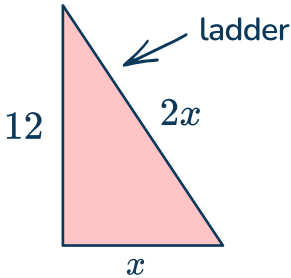
Quadratic Equations Worksheet | Grades 9 to 12 | Answers

Question number	Question	Answers	Standard
11	The side of a square is $x + 1$ and the area is 121 units ² . Find the value of x .	<p>Area = base x height $(x + 1)(x + 1) = 121$ $x^2 + 2x + 1 = 121$ $x^2 + 2x - 120 = 0$ $(x - 10)(x + 12) = 0$ $x - 10 = 0$ $x + 12 = 0$ $x = 10$ $x = -12$</p> <p>The value of $x = 10$ because it will give side lengths of 11. The length of the side of a square cannot be negative so -12 is not a solution.</p>	HSA.SSE.B.3a
12	Tommy made a 4ft by 5ft rug. He decides to increase both sides by the same amount so that it has an area of 56 ft ² . Find the amount he increased both sides by.	<p>$(4 + x)(5 + x) = 56$ $20 + 9x + x^2 = 56$ $x^2 + 9x - 36 = 0$ $(x - 3)(x + 12) = 0$ $x - 3 = 0$ $x + 12 = 0$ $x = 3$ $x = -12$</p> <p>Each side of the rug increased by 3 ft. Length cannot be negative so -12 does not work in this case.</p>	HSA.SSE.B.3a

Quadratic Equations Worksheet | Grades 9 to 12 | Answers

Question number	Question	Answers	Standard
13	The product of two consecutive integers is 56. Find the numbers.	x and $x + 1$ represent consecutive integers $x(x + 1) = 56$ $x^2 + x = 56$ $x^2 + x - 56 = 0$ $(x + 8)(x - 7) = 0$ $x + 8 = 0$ $x - 7 = 0$ $x = -8$ $x = 7$ The integers are: -8 and -7 OR 7 and 8	HSA.SSE.B.3a
14	The product of two consecutive odd integers is 63. Find the numbers.	x and $x + 2$ represent the consecutive odd integers $x(x + 2) = 63$ $x^2 + 2x = 63$ $x^2 + 2x - 63 = 0$ $(x + 9)(x - 7) = 0$ $x + 9 = 0$ $x - 7 = 0$ $x = -9$ $x = 7$ The integers are: -9 and -7 OR 7 and 9	HSA.SSE.B.3a

Quadratic Equations Worksheet | Grades 9 to 12 | Answers




Question number	Question	Answers	Standard
15	A ladder is resting against a wall. The top of the ladder touches the wall at a height of 12 feet. Find the distance from the wall to the bottom of the ladder if the length of the ladder is twice the distance from the bottom of the ladder to the wall.	 $12^2 + x^2 = (2x)^2$ $144 + x^2 = 4x^2$ $144 = 3x^2$ $48 = x^2$ $x \approx 6.9 \text{ ft}$	HSA.SSE.B.3a

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