THIRD SPACE LEARNING

Factoring quadratics Worksheet

Algebra

Grades 9 to 12

Skill Questions

Name: .....

Date: .....

1 Factor the expression:

$x^2 + 3x - 10$

Answer

2 Factor the expression:

$x^2 + 2x - 48$

Answer

3 Factor the expression:

$x^2 - 5x - 84$

Answer

4 Factor the expression:

$x^2 + 20x + 99$

Answer

5 Factor the expression:

$a^2 + 2ab + b^2$

Answer

6 Factor the expression:

$2x^2 - 17x + 8$

Answer

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7 Factor the expression:

$3x^2 + 11x - 42$

Answer

---

8 Factor the expression:

$8x^2 + 6xy + y^2$

Answer

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9 Solve the equation by factoring.

$7x^2 - 27x - 4 = 0$

Answer

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10 Solve the equation by factoring.

$3x^2 - 23x = 36$

Answer

Applied Questions

11 Explain the error in the factoring problem below and make the correction.

$6a^2 + ab - b^2$

$(6a + b)(a - b)$

Answer

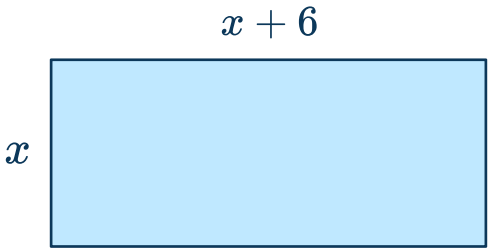
12 The sum of two numbers is 18 and the product of the two numbers is 56. Find the two numbers.

Answer

13 A rectangular garden has an area of 96 square meters. The length of the garden is 4 meters longer than its width. What are the dimensions of the garden?

Answer

14 Find the dimensions of the rectangle that has an area of 91 square inches.



Answer

15 Factor the expression completely:

$3x^4 - 11x^2 - 4$

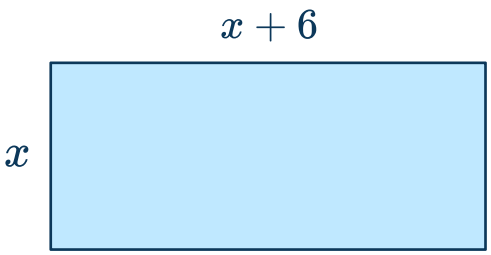
Answer

Answers

Question number	Question	Answers	Standard
1	Factor the expression: $x^2 + 3x - 10$	$(x + 5)(x - 2)$	HSA-SSE.B.3a
2	Factor the expression: $x^2 + 2x - 48$	$(x + 8)(x - 6)$	HSA-SSE.B.3a
3	Factor the expression: $x^2 - 5x - 84$	$(x - 12)(x + 7)$	HSA-SSE.B.3a
4	Factor the expression: $x^2 + 20x + 99$	$(x + 9)(x + 11)$	HSA-SSE.B.3a
5	Factor the expression: $a^2 + 2ab + b^2$	$(a + b)(a + b)$	HSA-SSE.B.3a
6	Factor the expression: $2x^2 - 17x + 8$	$(2x - 1)(x - 8)$	HSA-SSE.B.3a
7	Factor the expression: $3x^2 + 11x - 42$	$(3x - 7)(x + 6)$	HSA-SSE.B.3a
8	Factor the expression: $8x^2 + 6xy + y^2$	$(2x + y)(4x + y)$	HSA-SSE.B.3a

Question number	Question	Answers	Standard
9	Solve the equation by factoring. $7x^2 - 27x - 4 = 0$	$(7x + 1)(x - 4) = 0$ $7x + 1 = 0$ $\quad x - 4 = 0$ $7x = -1$ $\quad x = 4$ $x = -\frac{1}{7}$	HSA-SSE.B.3a HSA.REI.B.4
10	Solve the equation by factoring. $3x^2 - 23x = 36$	$3x^2 - 23x = 36$ $3x^2 - 23x - 36 = 0$ $(3x + 4)(x - 9) = 0$ $3x + 4 = 0$ $\quad x - 9 = 0$ $x = -\frac{4}{3}$ $\quad x = 9$	HSA-SSE.B.3a HSA.REI.B.4
11	Explain the error in the factoring problem below and make the correction. $6a^2 + ab - b^2$ $(6a + b)(a - b)$	$6a^2 + ab - b^2$ $(6a + b)(a - b)$ The error is made in the factors of the first term. It shouldn't be $6a$ times a because when you multiply the inside terms and outside terms you get $+1ab$ and $-6ab$ which sums to $-5ab$. It should be factored like this: $6a^2 + ab - b^2$ $(2a + b)(3a - b)$ The inside terms multiply to be $3ab$ and the outside terms multiply to be $-2ab$ which sum to $+1ab$.	HSA-SSE.B.3a

Question number	Question	Answers	Standard
12	The sum of two numbers is 18 and the product of the two numbers is 56. Find the two numbers.	$x + y = 18$ $xy = 56$ $x = 18 - y$ $(18 - y)\, y = 56$ $18y - y^2 = 56$ $-y^2 + 18y - 56 = 0$ $y^2 - 18y + 56 = 0$ $(y - 4)(y - 14) = 0$ $y - 4 = 0 \quad y - 14 = 0$ $y = 4 \qquad y = 14$	HSA-SSE.B.3a HSA.REI.B.4
13	A rectangular garden has an area of 96 square meters. The length of the garden is 4 meters longer than its width. What are the dimensions of the garden?	Length: $x + 4$ Width: x $x\,(x + 4) = 96$ $x^2 + 4x = 96$ $x^2 + 4x - 96 = 0$ $(x + 12)(x - 8) = 0$ $x = -12 \qquad x = 8$ -12 does not work because you cannot have a negative side length, so $x = 8$ is the value to use. Length: 12 Width: 8	HSA-SSE.B.3a HSA.REI.B.4

Question number	Question	Answers	Standard
14	Find the dimensions of the rectangle that has an area of 91 square inches.  	$x(x + 6) = 91$ $x^2 + 6x - 91 = 0$ $(x + 13)(x - 7) = 0$ $x = -13 \quad x = 7$ -13 cannot be used because you cannot have a negative side length. $x = 7$ is the correct value of x to use. The dimensions of the rectangle are 7 by 13.	HSA-SSE.B.3a HSA.REI.B.4
15	Factor the expression completely: $3x^4 - 11x^2 - 4$	$3x^4 - 11x^2 - 4$ $(3x^2 + 1)(x^2 - 4)$ $(3x^2 + 1)(x - 2)(x + 2)$	HSA-SSE.B.3a

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