



THIRD SPACE  
LEARNING

# Factoring the difference of two squares Worksheet

Algebra

Grades 9 to 12

## Skill Questions

Name: .....

Date: .....

1 Factor the expression:

$$x^2 - 1$$

Answer

2 Factor the expression:

$$x^2 - y^2$$

Answer

3 Factor the expression:

$$144 - a^2$$

Answer

4 Factor the expression:

$$100b^2 - 1$$

Answer

5 Factor the expression:

$$m^2n^2 - 4$$

Answer

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6 Factor the expression:

$$169t^2 - 121$$

Answer

7 Factor the expression:

$$-25 + s^2$$

Answer

8 Solve the equation by factoring.

$$x^2 - 9 = 0$$

Answer

9 Solve the equation by factoring.

$$8 - y^2 = -28$$

Answer

10 Solve the equation by factoring.

$$4x^2 - 7 = 18$$

Answer

## Applied Questions

- 11 Find the expression that represents the length of a rectangle if the area is represented by  $a^2 - 81$  and the width is represented by  $a + 9$ .

Answer

- 12 Scarlett and Milly are in algebra class and had to factor the quadratic expression,  $r^4s^2 - 1$ .

Scarlett factored it to be:  $(rs - 1)(rs + 1)$

Milly factored it to be:  $(r^2s - 1)(r^2s + 1)$

A. Who factored the quadratic correctly?

Answer

B. Explain the mistake that was made.

Answer

- 13 Factor the expression completely.

$$m^4 - 16$$

Answer

- 14 Write expressions representing the length and the width of a rectangle if the area is represented by  $x^2y^4 - z^6$ .

Answer

- 15 Solve the equation by factoring.

$$m^4 - 4 = 12$$

Answer

## Answers

| Question number | Question                                          | Answers                                                                              | Standard                    |
|-----------------|---------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------|
| 1               | Factor the expression:<br>$x^2 - 1$               | $(x + 1)(x - 1)$                                                                     | HSA-SSE.B.3a                |
| 2               | Factor the expression:<br>$x^2 - y^2$             | $(x + y)(x - y)$                                                                     | HSA-SSE.B.3a                |
| 3               | Factor the expression:<br>$144 - a^2$             | $(12 - a)(12 + a)$                                                                   | HSA-SSE.B.3a                |
| 4               | Factor the expression:<br>$100b^2 - 1$            | $(10b + 1)(10b - 1)$                                                                 | HSA-SSE.B.3a                |
| 5               | Factor the expression:<br>$m^2n^2 - 4$            | $(mn - 2)(mn + 2)$                                                                   | HSA-SSE.B.3a                |
| 6               | Factor the expression:<br>$169t^2 - 121$          | $(13t - 11)(13t + 11)$                                                               | HSA-SSE.B.3a                |
| 7               | Factor the expression:<br>$-25 + s^2$             | $-25 + s^2$<br>$s^2 - 25$<br>$(s + 5)(s - 5)$                                        | HSA-SSE.B.3a                |
| 8               | Solve the equation by factoring.<br>$x^2 - 9 = 0$ | $x^2 - 9 = 0$<br>$(x - 3)(x + 3) = 0$<br>$x - 3 = 0$ $x + 3 = 0$<br>$x = 3$ $x = -3$ | HSA-SSE.B.3a<br>HSA.REI.B.4 |

## Factoring the difference of two squares Worksheet | Grades 9 to 12| Answers

| Question number | Question                                                                                                                                                                                                                                                                                                 | Answers                                                                                                                                                                                         | Standard                    |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| 9               | Solve the equation by factoring.<br>$8 - y^2 = -28$                                                                                                                                                                                                                                                      | $8 - y^2 = -28$<br>$36 - y^2 = 0$<br>$(6 - y)(6 + y) = 0$<br>$6 - y = 0 \quad 6 + y = 0$<br>$-y = -6 \quad y = -6$<br>$y = 6$                                                                   | HSA-SSE.B.3a<br>HSA.REI.B.4 |
| 10              | Solve the equation by factoring.<br>$4x^2 - 7 = 18$                                                                                                                                                                                                                                                      | $4x^2 - 25 = 0$<br>$(2x - 5)(2x + 5) = 0$<br>$2x - 5 = 0 \quad 2x + 5 = 0$<br>$2x = 5 \quad 2x = -5$<br>$x = 2.5 \quad x = -2.5$                                                                | HSA-SSE.B.3a<br>HSA.REI.B.4 |
| 11              | Find the expression that represents the length of a rectangle if the area is represented by $a^2 - 81$ and the width is represented by $a + 9$ .                                                                                                                                                         | $a^2 - 81$<br>$(a - 9)(a + 9) = a^2 - 81$<br>$(a + 9)$ represents the width so the length is represented by $(a - 9)$                                                                           | HSA-SSE.B.3a<br>HSA.REI.B.4 |
| 12              | Scarlett and Milly are in algebra class and had to factor the quadratic expression, $r^4s^2 - 1$ .<br><br>Scarlett factored it to be: $(rs - 1)(rs + 1)$<br><br>Milly factored it to be: $(r^2s - 1)(r^2s + 1)$<br><br>A) Who factored the quadratic correctly?<br>B) Explain the mistake that was made. | A) Milly factored the expression correctly.<br>B) Scarlett's mistake was made with the exponents of $r$ . The original expression has $r^4$ so when it's factored it should be $r^2 \times r^2$ | HSA-SSE.B.3a                |

## Factoring the difference of two squares Worksheet | Grades 9 to 12| Answers

| Question number | Question                                                                                                              | Answers                                                                                                                                                                                              | Standard     |
|-----------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 13              | Factor the expression completely.<br>$m^4 - 16$                                                                       | $m^4 - 16$<br>$(m^2 - 4)(m^2 + 4)$<br>$(m - 2)(m + 2)(m^2 + 4)$                                                                                                                                      | HSA-SSE.B.3a |
| 14              | Write expressions representing the length and the width of a rectangle if the area is represented by $x^2y^4 - z^6$ . | The width and length of a rectangle with an area of $x^2y^4 - z^6$ is $(xy^2 - z^3)(xy^2 + z^3)$                                                                                                     | HSA-SSE.B.3a |
| 15              | Solve the equation by factoring.<br>$m^4 - 4 = 12$                                                                    | $m^4 - 4 = 12$<br>$m^4 - 16 = 0$<br>$(m^2 - 4)(m^2 + 4) = 0$<br>$(m - 2)(m + 2)(m^2 + 4) = 0$<br>$m - 2 = 0 \quad m + 2 = 0$<br>$m^2 + 4 = 0 \quad m = 2$<br>$m = -2 \quad m^2 = -4$<br>$m = \pm 2i$ | HSA-SSE.B.3a |

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