THIRD SPACE LEARNING

Factoring by grouping Worksheet

Algebra

Grades 9 to 12

Skill Questions

Name: .....

Date: .....

1 Factor the expression:

$x(y-4)+7(y-4)$

Answer

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2 Factor the expression:

$12b^3-9b^2+4b-3$

Answer

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3 Factor the expression:

$2a^3+5a^2+6a+15$

Answer

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4 Factor the expression:

$2y+10+5y^3+25y^2$

Answer

5 Factor the expression:

$a^3 + 7a^2 + 2ab + 14b$

Answer

6 Factor the expression:

$5x^3 - 15x^2y - 4xy + 12y^2$

Answer

7 Factor the expression:

$4b^3 - 2b^2 - 18b + 9$

Answer

8 Factor the expression:

$15y^3 + 40y^2 - 6y - 16$

Answer

9 Factor the expression:

$t^3 - t^2 - 8t + 8$

Answer

10 Factor the expression:

$6f^3 + f^2 - 30f - 5$

Answer

Applied Questions

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

$6x^3 - 15x^2 - 4x + 10$

$3x^2(2x - 5) + 2(2x - 5)$

$(2x - 5)(3x^2 + 2)$

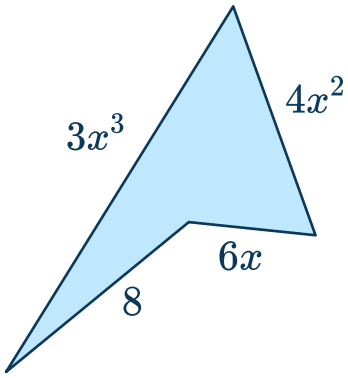
Answer

12 Explain the error in the factoring problem below and make the corrections.

$4x^3 - x^2 - 16x + 4$
$x^2(4x - 1) + 4(4x + 1)$

Answer

13 Write an expression for the perimeter of the polygon and then factor the expression completely.



Answer

14 Kamala says that the equation can be solved for x using factoring by grouping. Bey disagrees and says that the equation cannot be solved by factoring by grouping. Who is correct?

$x^3 + 6x^2 + 4x + 24 = 0$

Answer

15 Solve the equation by factoring by grouping.

$x^3 + x^2 - 9x - 7 = 2$

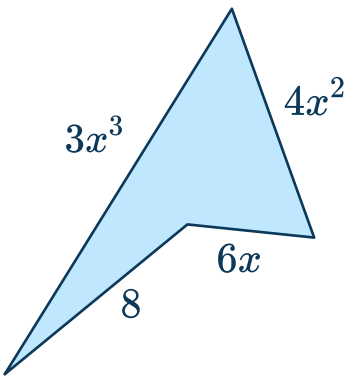
Answer

Answers

Question number	Question	Answers	Standard
1	Factor the expression: $x(y-4)+7(y-4)$	$x(y-4)+7(y-4)$ $(y-4)(x+7)$	HSA-SSE.B.3a
2	Factor the expression: $12b^3-9b^2+4b-3$	$12b^3-9b^2+4b-3$ $3b^2(4b-3)+(4b-3)$ $(3b^2+1)(4b-3)$	HSA-SSE.B.3a
3	Factor the expression: $2a^3+5a^2+6a+15$	$2a^3+5a^2+6a+15$ $a^2(2a+5)+3(2a+5)$ $(a^2+3)(2a+5)$	HSA-SSE.B.3a
4	Factor the expression: $2y+10+5y^3+25y^2$	$2y+10+5y^3+25y^2$ $2(y+5)+5y^2(y+5)$ $(y+5)(2+5y^2)$	HSA-SSE.B.3a
5	Factor the expression: $a^3+7a^2+2ab+14b$	$a^3+7a^2+2ab+14b$ $a^2(a+7)+2b(a+7)$ $(a+7)(a^2+2b)$	HSA-SSE.B.3a
6	Factor the expression: $5x^3-15x^2y-4xy+12y^2$	$5x^3-15x^2y-4xy+12y^2$ $5x^2(x-3y)-4y(x-3y)$ $(x-3y)(5x^2-4y)$	HSA-SSE.B.3a
7	Factor the expression: $4b^3-2b^2-18b+9$	$4b^3-2b^2-18b+9$ $2b^2(2b-1)-9(2b-1)$ $(2b-1)(2b^2-9)$	HSA-SSE.B.3a
8	Factor the expression: $15y^3+40y^2-6y-16$	$15y^3+40y^2-9y-24$ $5y^2(3y+8)-3(3y+8)$ $(3y+8)(5y^2-2)$	HSA-SSE.B.3a

Factoring by grouping Worksheet | Grades 9 to 12 | Answers

Question number	Question	Answers	Standard
9	Factor the expression: $t^3 - t^2 - 8t + 8$	$t^3 - t^2 - 8t + 8$ $t^2(t-1) - 8(t-1)$ $(t-1)(t^2 - 8)$	HSA-SSE.B.3a
10	Factor the expression: $6f^3 + f^2 - 30f - 5$	$6f^3 + f^2 - 30f - 5$ $f^2(6f+1) - 5(6f+1)$ $(6f+1)(f^2 - 5)$	HSA-SSE.B.3a
11	Explain the error in the factoring problem below and make the correction. $6x^3 - 15x^2 - 4x + 10$ $3x^2(2x-5) + 2(2x-5)$ $(2x-5)(3x^2+2)$	$6x^3 - 15x^2 - 4x + 10$ $3x^2(2x-5) + 2(2x-5)$ The error was made in this step. In the second expression, -2 is the factor that should have been factored from the binomial not +2. $3x^2(2x-5) - 2(2x-5)$ (correction) $(2x-5)(3x^2-2)$	HSA-SSE.B.3a

Question number	Question	Answers	Standard
12	Explain the error in the factoring problem below and make the corrections. $4x^3 - x^2 - 16x + 4$ $x^2(4x - 1) + 4(4x + 1)$	$4x^3 - x^2 - 16x + 4$ $x^2(4x - 1) + 4(4x + 1)$ The error was made in this step. In the second set of parenthesis, -4 should have been factored out of the expression not +4. So, it should have been: $x^2(4x - 1) - 4(4x - 1)$ $(x^2 - 4)(4x - 1)$ You can factor this further because the first set of parentheses is the difference of two perfect squares. $(x + 2)(x - 2)(4x - 1)$	HSA-SSE.B.3a
13	Write an expression for the perimeter of the polygon and then factor the expression completely.  	Perimeter= $3x^3 + 4x^2 + 6x + 8$ Perimeter= $x^2(3x + 4) + 2(3x + 4)$ Perimeter= $(3x + 4)(x^2 + 2)$	HSA-SSE.B.3a

Question number	Question	Answers	Standard
14	Kamala says that the equation can be solved for x using factoring by grouping. Bey disagrees and says that the equation cannot be solved by factoring by grouping. Who is correct? $x^3 + 6x^2 + 4x + 24 = 0$	Kamala is correct, the equation can be solved using factoring by grouping. $x^3 + 6x^2 + 4x + 24 = 0$ $x^2(x + 6) + 4(x + 6) = 0$ $(x + 6)(x^2 + 4) = 0$ $x + 6 = 0 \quad x^2 + 4 = 0$ $x = -6 \quad x^2 = -4$ $x = \pm 2i$	HSA-SSE.B.3a HSA.REI.B.4
15	Solve the equation by factoring by grouping. $x^3 + x^2 - 9x - 7 = 2$	$x^3 + x^2 - 9x - 7 = 2$ $x^3 + x^2 - 9x - 9 = 0$ $x^2(x + 1) - 9(x + 1) = 0$ $(x + 1)(x^2 - 9) = 0$ $x + 1 = 0 \quad x^2 - 9 = 0$ $x = -1 \quad x^2 = 9$ $x = \pm 3$	HSA-SSE.B.3a HSA.REI.B.4

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