

Lesson 10-4: Factoring to Solve Quadratic Equations

Part 1: Solving Quadratic Equations

1. 069909a, P.I. A.A.28
The larger root of the equation $(x + 4)(x - 3) = 0$ is
[A] 4 [B] -4 [C] -3 [D] 3
2. 080622a, P.I. A.A.27
One of the roots of the equation $x^2 + 3x - 18 = 0$ is 3. What is the other root?
[A] 15 [B] -21 [C] -6 [D] 6
3. 010727a, P.I. A.A.27
What is the solution set of the equation $x^2 - 5x = 0$?
[A] {0,-5} [B] {5} [C] {0} [D] {0,5}
4. 080012a, P.I. A.A.27
The solution set for the equation $x^2 - 2x - 15 = 0$ is
[A] {-5,-3} [B] {-5,3}
[C] {5,-3} [D] {5,3}
5. 060725a, P.I. A.A.27
The solution set of the equation $x^2 - 4x - 12 = 0$ is
[A] {-6,2} [B] {-3,4}
[C] {-2,6} [D] {-4,3}
6. 080118a, P.I. A.A.27
What is the solution set of $m^2 - 3m - 10 = 0$?
[A] {3,-10} [B] {3,10}
[C] {5,-2} [D] {2,-5}
7. 060313a, P.I. A.A.27
What is the solution set of the equation $x^2 - 5x - 24 = 0$?
[A] {3,8} [B] {3,-8}
[C] {-3,8} [D] {-3,-8}
8. 010520a, P.I. A.A.27
What is the solution set for the equation $x^2 - 5x + 6 = 0$?
[A] {-6,1} [B] {2,3}
[C] {-2,-3} [D] {6,-1}
9. 060514a, P.I. A.A.27
What is the solution set of the equation $x^2 + 11x + 28 = 0$?
[A] {3,4} [B] {-7,4}
[C] {-7,-4} [D] {-3,-4}
10. 089926a, P.I. A.A.27
Solve for x : $x^2 + 3x - 40 = 0$
11. 060229a, P.I. A.A.27
Solve for x : $x^2 + 3x - 28 = 0$
12. 010637a, P.I. A.A.27
Solve for x : $x^2 + 2x - 24 = 0$
13. 080525a, P.I. A.A.27
The solution set for the equation $x^2 - 5x = 6$ is
[A] {1,-6} [B] {-1,6}
[C] {-2,3} [D] {2,-3}
14. 060430a, P.I. A.A.28
If $(x - 4)$ is a factor of $x^2 - x - w = 0$, then the value of w is
[A] 12 [B] -3 [C] -12 [D] 3

15. 080627a, P.I. A.A.8
When Albert flips open his mathematics textbook, he notices that the product of the page numbers of the two facing pages that he sees is 156. Which equation could be used to find the page numbers that Albert is looking at?
- [A] $(x+1) + (x+2) = 156$
[B] $(x+1)(x+3) = 156$
[C] $x + (x+1) = 156$ [D] $x(x+1) = 156$
16. fall0726ia, P.I. A.A.8
The length of a rectangular window is 5 feet more than its width, w . The area of the window is 36 square feet. Which equation could be used to find the dimensions of the window?
- [A] $w^2 - 5w + 36 = 0$ [B] $w^2 - 5w - 36 = 0$
[C] $w^2 + 5w + 36 = 0$ [D] $w^2 + 5w - 36 = 0$
17. 010326a, P.I. A.A.8
Three brothers have ages that are consecutive even integers. The product of the first and third boys' ages is 20 more than twice the second boy's age. Find the age of *each* of the three boys.
18. 060636a, P.I. A.A.8
Tamara has two sisters. One of the sisters is 7 years older than Tamara. The other sister is 3 years younger than Tamara. The product of Tamara's sisters' ages is 24. How old is Tamara?
19. 060131a, P.I. A.A.8
Find three consecutive odd integers such that the product of the first and the second exceeds the third by 8.
20. 060606b, P.I. A.A.8
If the equation $x^2 - kx - 36 = 0$ has $x = 12$ as one root, what is the value of k ?
- [A] -9 [B] 3 [C] -3 [D] 9
21. 060104a, P.I. A2.A.7
One root of the equation $2x^2 - x - 15 = 0$ is
- [A] -3 [B] 3 [C] $\frac{3}{2}$ [D] $\frac{5}{2}$
22. 010419a, P.I. A2.A.7
What is the solution set of the equation $3x^2 - 34x - 24 = 0$?
- [A] $\{-\frac{2}{3}, 12\}$ [B] $\{-12, \frac{2}{3}\}$
[C] $\{-2, 6\}$ [D] $\{-6, 2\}$
23. 080112b, P.I. A.A.8
A ball is thrown straight up at an initial velocity of 54 feet per second. The height of the ball t seconds after it is thrown is given by the formula $h(t) = 54t - 12t^2$. How many seconds after the ball is thrown will it return to the ground?
- [A] 6 [B] 4.5 [C] 9.2 [D] 4
24. 080612b, P.I. A.A.8
For which equation is the sum of the roots equal to the product of the roots?
- [A] $x^2 - 4x + 4 = 0$ [B] $x^2 - 8x - 4 = 0$
[C] $x^2 + x + 1 = 0$ [D] $x^2 + 3x - 6 = 0$
25. 010830b, P.I. A2.A.21
Write a quadratic equation such that the sum of its roots is -5 and the product of its roots is 6. What are the roots of this equation?

[1] D

[2] C

[3] D

[4] C

[5] C

[6] C

[7] C

[8] B

[9] C

[3] -8 and 5 and appropriate work is shown, such as factoring or trial and error.

[2] The student shows correct factoring into $(x + 8)(x - 5)$ or correct use of the quadratic formula but finds only one correct value for x .

[1] Correct factoring is shown, but no values are found.

or

[1] Incorrect factoring is shown, but two appropriate values are found.

or

[1] Either -8 or 5 is arrived at by trial and error.

or

[1] -8 and 5 and no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[10] incorrect procedure.

[3] -7 and 4, and appropriate work is shown, such as factoring.

[2] Correct factoring $(x + 7)(x - 4)$ is shown, but only one correct value of x is found.

or [2] Correct factoring is shown, but the negative value of x is rejected.

[1] Correct factoring is shown, but the values of x are not found.

or [1] Incorrect factoring is shown, but appropriate values are found.

or [1] Only one value is found by trial and error.

or [1] -7 and 4, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[11] incorrect procedure.

[3] -6 and 4, and appropriate work is shown, such as factoring or trial and error with at least three trials and appropriate checks.

[2] Appropriate work is shown, but one computational error is made.

or [2] Appropriate work is shown, but only one correct value for x is found.

or [2] The trial-and-error method is used to find the correct solutions, but only two trials and appropriate checks are shown.

[1] Appropriate work is shown, but two or more computational errors are made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] The equation is factored correctly, but no values are found.

or [1] The equation is factored incorrectly, but two appropriate values are found.

or [1] -6 and 4, but no work or only one trial with an appropriate check is shown.

[0] -6 or 4, but no work or only one trial with an appropriate check is shown.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[12] obviously incorrect procedure.

[13] B

[14] A

[15] D

[16] D

[3] 4, 6, and 8, and appropriate work is shown, such as the correct quadratic equation or trial and error with at least three trials and appropriate checks.

[2] The correct quadratic equation is solved, but one computational error is made, but three appropriate ages are listed.

or [2] The correct quadratic equation is solved, but the negative root is not rejected, but three appropriate ages are listed.

or [2] The correct quadratic equation is solved, but only one age is found.

or [2] The trial-and-error method is used to find a correct solution, but only two trials and appropriate checks are shown.

[1] An incorrect equation of lesser difficulty is solved appropriately, and the three ages are listed.

or [1] An incorrect quadratic equation of equal difficulty is solved appropriately, and the three ages are listed.

or [1] The correct quadratic equation is shown, but more than one computational error is made.

or [1] The correct quadratic equation is shown, but no further correct work is shown.

or [1] 4, 6, and 8, but no work or only one trial with an appropriate check is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[17] incorrect procedure.

[3] 5, and appropriate work is shown, such as the quadratic equation $(x + 7)(x - 3) = 24$ or trial and error with at least three trials and appropriate checks.

[2] A correct quadratic equation is written, but one computational error is made in finding Tamara's age.

or [2] 12 and 2 are found as the sisters' ages, but Tamara's age is not found.

or [2] The trial-and-error method is used to find the correct solution, but only two trials and appropriate checks are shown.

[1] Appropriate work is shown, but two or more computational errors are made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] A correct quadratic equation is written, but no further correct work is shown.

or [1] An incorrect equation of equal difficulty is solved appropriately for Tamara's age.

or [1] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no solution is found.

or [1] 5, but no work or only one trial with an appropriate check is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[18] incorrect procedure.

[4] 3, 5, and 7, and appropriate work is shown, such as an appropriate quadratic equation or trial-and-error method.

[3] An appropriate equation is written and solved, but one computational error is made.

or [3] An appropriate equation is written and solved, but the even solutions are also listed.

[2] An incorrect quadratic equation is shown, but it is solved appropriately.

or [2] Integers are misrepresented, but the subsequent quadratic equation is solved appropriately.

or [2] An appropriate equation is written and solved, but more than one computational error is made.

or [2] The correct solution is given, but only one trial is shown with appropriate checks when a trial-and-error method is used.

[1] A linear equation is solved appropriately.

or [1] 3, 5, and 7, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[19] incorrect procedure.

[20] D

[21] B

[22] A

[23] B

[24] A

[4] $x^2 + 5x + 6 = 0$ or an equivalent equation and -3 and -2, and appropriate work is shown, such as using the sum and product formulas or factoring the equation.

[3] Appropriate work is shown, but one computational or factoring error is made.

or [3] The expression $x^2 + 5x + 6 = 0$ is written and -3 and -2, and appropriate work is shown.

[2] Appropriate work is shown, but two or more computational or factoring errors are made.

or [2] Appropriate work is shown, but one conceptual error is made.

or [2] A correct quadratic equation is written, and appropriate work is shown, but the roots are not found.

or [2] Appropriate work is shown to find -3 and -2, but no quadratic equation is written.

[1] Appropriate work is shown, but one conceptual error and one computational or factoring error are made.

or [1] $x^2 + 5x + 6 = 0$ or an equivalent equation and -3 and -2, but no work is shown.

[0] A correct quadratic equation or -3 and -2, but no work is shown.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[25] obviously incorrect procedure.
