

Section 14-1: The Meaning of an Algebraic Fraction

1. 080422a, P.I. A.A.15

For which value of x is the expression $\frac{x-7}{x+2}$ undefined?

[A] 2 [B] -2 [C] 0 [D] 7

2. 060319a, P.I. A.A.15

For which value of x is the expression $\frac{3x-6}{x-4}$ undefined?

[A] 2 [B] 0 [C] 4 [D] -4

3. 080610a, P.I. A.A.15

For which value of x is the expression $\frac{3}{x-2}$ undefined?

[A] 0 [B] 3 [C] 2 [D] -2

4. 010822a, P.I. A.A.15

For which value of x is the expression $\frac{6-x}{x+2}$ undefined?

[A] 2 [B] -2 [C] 0 [D] 6

5. 010607a, P.I. A.A.15

For which value of x will the fraction $\frac{3}{2x+4}$ be undefined?

[A] -2 [B] 2 [C] 0 [D] -4

6. fall0728ia, P.I. A.A.15

For which value of x is $\frac{x-3}{x^2-4}$ undefined?

[A] 4 [B] 3 [C] -2 [D] 0

7. 010716a, P.I. A.A.15

Which expression is undefined when $w = 3$?

[A] $\frac{w-3}{w+1}$ [B] $\frac{3w}{3w^2}$
[C] $\frac{w+1}{w^2-3w}$ [D] $\frac{w^2+2w}{5w}$

Section 14-2: Reducing Fractions to Lowest Terms

8. 010109a, P.I. A.A.14

If $x \neq 0$, the expression $\frac{x^2+2x}{x}$ is equivalent to

[A] 4 [B] 2 [C] $3x$ [D] $x+2$

9. 060102a, P.I. A.A.14

Which polynomial is the quotient of $\frac{6x^3+9x^2+3x}{3x}$?

[A] $2x^2+3x+1$ [B] $2x+3$
[C] $2x^2+3x$ [D] $6x^2+9x$

10. fall0718ia, P.I. A.A.14

The expression $\frac{9x^4-27x^6}{3x^3}$ is equivalent to

[A] $3x(1-3x)$ [B] $3x(1-3x^2)$
[C] $3x(1-9x^5)$ [D] $9x^3(1-x)$

11. 069924a, P.I. A.A.16

Simplify: $\frac{9x^2-15xy}{9x^2-25y^2}$

12. 010631a, P.I. A.A.16

Simplify: $\frac{x^2+6x+5}{x^2-25}$

13. 060712b, P.I. A.A.16

Which expression is in simplest form?

[A] $\frac{x}{x^2}$

[B] $\frac{x^2 - 4}{x + 2}$

[C] $\frac{9}{x^2 + 9}$

[D] $\frac{x^2 - 6x + 9}{x^2 - x - 6}$

14. 080305b, P.I. A.A.16

Written in simplest form, the expression

$\frac{x^2 y^2 - 9}{3 - xy}$ is equivalent to

[A] $-(3 + xy)$

[B] $3 + xy$

[C] $\frac{1}{3 + xy}$

[D] -1

15. 060325b

Express the following rational expression in

simplest form: $\frac{9 - x^2}{10x^2 - 28x - 6}$

16. 060202b, P.I. A.A.16

For all values of x for which the expression is

defined, $\frac{2x + x^2}{x^2 + 5x + 6}$ is equivalent to

[A] $\frac{x}{x + 2}$

[B] $\frac{x}{x + 3}$

[C] $\frac{1}{x + 3}$

[D] $\frac{1}{x + 2}$

17. 060504b, P.I. A.A.16

Written in simplest form, the expression

$\frac{x^2 - 9x}{45x - 5x^2}$ is equivalent to

[A] -5 [B] 5 [C] $\frac{1}{5}$ [D] $-\frac{1}{5}$

18. 080619b, P.I. A.A.16

The expression $\frac{3y^2 - 12y}{4y^2 - y^3}$ is equivalent to

[A] $\frac{3}{y}$ [B] $-\frac{9}{4}$ [C] $\frac{3}{4} - \frac{12}{y^2}$ [D] $-\frac{3}{y}$

Section 14-3: Multiplying Fractions

19. 060604a, P.I. A.A.12

What is the product of $\frac{1}{3}x^2y$ and $\frac{1}{6}xy^3$?

[A] $\frac{1}{9}x^3y^4$

[B] $\frac{1}{18}x^2y^3$

[C] $\frac{1}{18}x^3y^4$

[D] $\frac{1}{2}x^2y^3$

20. 080117b, P.I. A.A.18

If the length of a rectangular garden is

represented by $\frac{x^2 + 2x}{x^2 + 2x - 15}$ and its width is

represented by $\frac{2x - 6}{2x + 4}$, which expression

represents the area of the garden?

[A] x

[B] $\frac{x}{x + 5}$

[C] $x + 5$

[D] $\frac{x^2 + 2x}{2(x + 5)}$

21. 060124b, P.I. A.A.18

A rectangular prism has a length of

$\frac{2x^2 + 2x - 24}{4x^2 + x}$, a width of $\frac{x^2 + x - 6}{x + 4}$, and a

height of $\frac{8x^2 + 2x}{x^2 - 9}$. For all values of x for

which it is defined, express, in terms of x , the volume of the prism in simplest form.

Section 14-4: Dividing Fractions

22. 080022a, P.I. A.A.18

Perform the indicated operation and express the result in simplest terms: $\frac{x}{x+3} \div \frac{3x}{x^2-9}$

23. 060727b, P.I. A2.A.16

If $f(x) = \frac{3x^2-27}{18x+30}$ and $g(x) = \frac{x^2-7x+12}{3x^2-7x-20}$, find $f(x) \div g(x)$ for all values of x for which the expression is defined and express your answer in simplest form.

24. 010434b, P.I. A.A.18

Express in simplest form:

$$\frac{4x+8}{x+1} \cdot \frac{2-x}{3x-15} \div \frac{x^2-4}{2x^2-8x-10}$$

25. 010733b, P.I. A.A.18

Perform the indicated operations and simplify completely:

$$\frac{x^2-9}{x^2-5x} \cdot \frac{5x-x^2}{x^2-x-12} \div \frac{x-4}{x^2-8x+16}$$

Section 14-5: Adding or Subtracting Algebraic Fractions

26. 060412a

What is the least common denominator of $\frac{1}{2}$,

$$\frac{2}{7x}, \text{ and } \frac{5}{x}?$$

[A] $2x$ [B] $9x$ [C] $14x$ [D] $14x^2$

27. 089911a, P.I. A.A.17

Which expression is equivalent to $\frac{a}{x} + \frac{b}{2x}$?

[A] $\frac{2a+b}{2x}$

[B] $\frac{a+b}{2x}$

[C] $\frac{a+b}{3x}$

[D] $\frac{2a+b}{x}$

28. 080207a, P.I. A.A.17

The sum of $\frac{3}{x} + \frac{2}{5}$, $x \neq 0$, is

[A] $\frac{2x+15}{5x}$

[B] $\frac{1}{x}$

[C] $\frac{2x+15}{x+5}$

[D] $\frac{5}{x+5}$

29. 010423a, P.I. A.A.17

What is the sum of $\frac{2}{x}$ and $\frac{x}{2}$?

[A] $\frac{4+x}{2x}$

[B] 1

[C] $\frac{4+x^2}{2x}$

[D] $\frac{2+x}{2x}$

30. 060727a, P.I. A.A.17

What is the sum of $\frac{3}{7n}$ and $\frac{7}{3n}$?

[A] $\frac{58}{21n}$

[B] $\frac{42}{21n}$

[C] $\frac{1}{n}$

[D] $\frac{10}{21n}$

31. 010016a, P.I. A.A.17

The expression $\frac{y}{x} - \frac{1}{2}$ is equivalent to

[A] $\frac{1-y}{2x}$

[B] $\frac{2y-x}{2x}$

[C] $\frac{x-2y}{2x}$

[D] $\frac{y-1}{x-2}$

32. 069906a, P.I. A.A.16

Expressed as a single fraction, what is

$$\frac{1}{x+1} + \frac{1}{x}, x \neq 0, -1?$$

[A] $\frac{2}{2x+1}$

[B] $\frac{2x+3}{x^2+x}$

[C] $\frac{3}{x^2}$

[D] $\frac{2x+1}{x^2+x}$

33. 060524b, P.I. A2.A.16

Express in simplest form: $\frac{1}{x} + \frac{1}{x+3}$

34. 010315b, P.I. A2.A.16

What is the sum of $\frac{3}{x-3}$ and $\frac{x}{3-x}$?

[A] $\frac{x+3}{x-3}$ [B] 0 [C] 1 [D] -1

35. 080505b, P.I. A2.A.16

What is the sum of $(y-5) + \frac{3}{y+2}$?

[A] $\frac{y^2-7}{y+2}$

[B] $y-5$

[C] $\frac{y-2}{y+2}$

[D] $\frac{y^2-3y-7}{y+2}$

36. 080733b, P.I. A2.A.16

Express in simplest form:

$$\frac{2x}{x^2-4} \div \frac{4}{x^2-4x+4} + \frac{12}{x^2-4} \cdot \frac{2-x}{3}$$

38. 080708a, P.I. A.A.25

In the equation $\frac{1}{4}n + 5 = 5\frac{1}{2}$, n is equal to

[A] $\frac{1}{2}$ [B] $\frac{1}{8}$ [C] 2 [D] 8

39. 010719a, P.I. A.A.25

What is the value of x in the equation

$$\frac{x}{2} + \frac{x}{6} = 2?$$

[A] 12 [B] 8 [C] $\frac{1}{4}$ [D] 3

40. 010507a, P.I. A.A.25

What is the solution set of the equation

$$\frac{x}{5} + \frac{x}{2} = 14?$$

[A] {20} [B] {10} [C] {49} [D] {4}

41. 080406a, P.I. A.A.22

What is the value of n in the equation $0.6(n+10) = 3.6$?

[A] -4 [B] -0.4 [C] 4 [D] 5

42. 010204a, P.I. A.A.25

What is the value of x in the equation

$$\frac{3}{4}x + 2 = \frac{5}{4}x - 6?$$

[A] 16 [B] -16 [C] 4 [D] -4

43. 060704a, P.I. A.A.25

What is the value of w in the equation

$$\frac{1}{2}w + 7 = 2w - 2?$$

[A] 3.6 [B] 2 [C] $3\frac{1}{3}$ [D] 6

Section 14-6: Solving Equations with Fractional Coefficients

37. 010636a, P.I. A.A.25

Solve for x : $\frac{1}{16}x + \frac{1}{4} = \frac{1}{2}$

44. 080620a, P.I. A.A.25
What is the value of w in the equation
$$\frac{3}{4}w + 8 = \frac{1}{3}w - 7$$

[A] 2.4 [B] -36 [C] -0.2 [D] -13.846

45. 060323a, P.I. A.A.22
Solve for m : $0.6m + 3 = 2m + 0.2$

46. 089921a, P.I. A.A.22
Solve for x : $2(x - 3) = 1.2 - x$

47. 060634a, P.I. A.A.25
Solve for x : $3.3 - x = 3(x - 1.7)$

48. 069925a, P.I. A.A.6
Sara's telephone service costs \$21 per month plus \$0.25 for each local call, and long-distance calls are extra. Last month, Sara's bill was \$36.64, and it included \$6.14 in long-distance charges. How many local calls did she make?

49. 060406a, P.I. A.A.6
Parking charges at Superior Parking Garage are \$5.00 for the first hour and \$1.50 for each additional 30 minutes. If Margo has \$12.50, what is the maximum amount of time she will be able to park her car at the garage?

[A] $6\frac{1}{2}$ hours [B] $3\frac{1}{2}$ hours

[C] 6 hours [D] $2\frac{1}{2}$ hours

50. 010726a, P.I. A.A.6
Mario paid \$44.25 in taxi fare from the hotel to the airport. The cab charged \$2.25 for the first mile plus \$3.50 for each additional mile. How many miles was it from the hotel to the airport?

[A] 12 [B] 10 [C] 11 [D] 13

51. 010635a, P.I. A.A.6
A candy store sells 8-pound bags of mixed hazelnuts and cashews. If c pounds of cashews are in a bag, the price p of the bag can be found using the formula
 $p = 2.59c + 1.72(8 - c)$. If one bag is priced at \$18.11, how many pounds of cashews does it contain?

52. 060418a, P.I. A.A.25
The number of people on the school board is represented by x . Two subcommittees with an equal number of members are formed, one with $\frac{2}{3}x - 5$ members and the other with $\frac{x}{4}$ members. How many people are on the school board?

[A] 12 [B] 20 [C] 4 [D] 8

53. 060111a, P.I. A.A.25
If one-half of a number is 8 less than two-thirds of the number, what is the number?

[A] 54 [B] 24 [C] 48 [D] 32

Section 14-7: Solving Inequalities with Fractional Coefficients

54. 010425a, P.I. A.A.24
The inequality $\frac{1}{2}x + 3 < 2x - 6$ is equivalent to

[A] $x < 6$ [B] $x > 6$

[C] $x > -\frac{5}{6}$ [D] $x < -\frac{5}{6}$

Section 14-8: Solving Fractional Equations

55. 080722b, P.I. A.A.26
Solve for all values of x : $\frac{2}{x+1} = x$

56. 080439a, P.I. A.A.26

Solve for all values of x that satisfy the equation $\frac{x}{x+3} = \frac{5}{x+7}$.

57. 010131a, P.I. A.A.26

Solve algebraically for x : $\frac{1}{x} = \frac{x+1}{6}$

58. fall0739ia, P.I. A.A.26

Solve for x : $\frac{x+1}{x} = \frac{-7}{x-12}$

59. 060612a, P.I. A.A.26

What is the value of x in the equation

$$\frac{x}{2x+1} = \frac{4}{3}?$$

[A] $-\frac{1}{5}$ [B] $-\frac{4}{5}$ [C] -5 [D] $-\frac{5}{4}$

60. 010224b, P.I. A2.A.23

A rectangle is said to have a golden ratio

when $\frac{w}{h} = \frac{h}{w-h}$, where w represents width

and h represents height. When $w = 3$, between which two consecutive integers will h lie?

61. 010825a, P.I. A.A.26

If $\frac{5}{n} - \frac{1}{2} = \frac{3}{6n}$, what is the value of n ?

[A] $\frac{2}{7}$ [B] 9 [C] -2 [D] 2

62. 060429b, P.I. A2.A.23

Solve for x and express your answer in

simplest radical form: $\frac{4}{x} - \frac{3}{x+1} = 7$

63. 080529b, P.I. A2.A.23

Solve for all values of x : $\frac{9}{x} + \frac{9}{x-2} = 12$

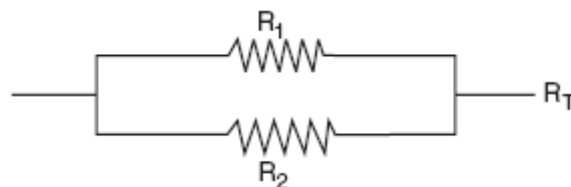
64. 080125b, P.I. A2.A.23

Working by herself, Mary requires 16 minutes more than Antoine to solve a mathematics problem. Working together, Mary and Antoine can solve the problem in 6 minutes. If this situation is represented by the equation $\frac{6}{t} + \frac{6}{t+16} = 1$, where t represents the

number of minutes Antoine works alone to solve the problem, how many minutes will it take Antoine to solve the problem if he works by himself?

65. 080234b, P.I. A2.A.23

Electrical circuits can be connected in series, one after another, or in parallel circuits that branch off a main line. If circuits are hooked up in parallel, the reciprocal of the total resistance in the series is found by adding the reciprocals of each resistance, as shown in the accompanying diagram.



$$\frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{R_T}$$

If $R_1 = x$, $R_2 = x + 3$, and the total resistance, R_T , is 2.25 ohms, find the positive value of R_1 to the nearest tenth of an ohm.

66. 060212b, P.I. A2.A.23

What is the solution set of the equation

$$\frac{x}{x-4} - \frac{1}{x+3} = \frac{28}{x^2 - x - 12}?$$

[A] { } [B] {-6} [C] {4} [D] {4,-6}

[1] B

[2] C

[3] C

[4] B

[5] A

[6] C

[7] C

[8] D

[9] A

[10] B

[2] $\frac{3x}{3x+5y}$

[1] One correct factoring is shown, either $3x(3x - 5y)$ or $(3x - 5y)(3x + 5y)$.

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

[11] incorrect procedure.

[2] $\frac{x+1}{x-5}$, and appropriate work is shown.

[1] Only one expression is factored correctly, such as $(x + 5)(x + 1)$ or $(x + 5)(x - 5)$, but an appropriate simplification is done.

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

[12] incorrect procedure.

[13] C

[14] A

[2] $\frac{-x-3}{10x+2}$ or an equivalent answer in

simplest form, and appropriate work is shown.

[1] Either the numerator or the denominator is factored completely.

or [1] Appropriate work is shown, but

$\frac{3-x}{x-3} = -1$ is not recognized.

or [1] $\frac{-x-3}{10x+2}$ or an equivalent answer in

simplest form, 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

[15] incorrect procedure.

[16] B

[17] D

[18] D

[19] C

[20] B

[2] $4(x - 2)$ or $4x - 8$, and appropriate work is shown.

[1] The problem is factored correctly but not reduced to simplest form.

or [1] Only two of the expressions are factored correctly, but an appropriate answer is found.

or [1] $4(x - 2)$ or $4x - 8$, but no work is shown.

[0] Only the formula for volume is shown.

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

[21] obviously incorrect procedure.

- [2] $\frac{x-3}{3}$ and multiplication by the reciprocal, correct factoring, and canceling are shown.
 [1] The difference of two squares, $x^2 - 9 = (x+3)(x-3)$, is factored correctly.
 or [1] Appropriate work is shown, but the final answer is incorrect.
 or [1] $\frac{x-3}{3}$ 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 incorrect procedure.
 [22] _____

- [4] $\frac{x+3}{2}$, and appropriate work is shown.
 [3] Appropriate work is shown, but one computational, factoring, or simplification error is made.
 [2] Appropriate work is shown, but two or more computational, factoring, or simplification errors are made.
 or [2] Appropriate work is shown, but one conceptual error is made, such as failing to multiply by the reciprocal of $g(x)$ or trying to solve for x .
 [1] Appropriate work is shown, but one conceptual error and one computational, factoring, or simplification error are made.
 or [1] $\frac{x+3}{2}$, 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 incorrect procedure.
 [23] _____

- [6] $-\frac{8}{3}$, and appropriate work is shown.
 [5] Appropriate work is shown, but one computational error is made.
 [4] Appropriate work is shown, but two or more computational errors are made.
 [3] Appropriate work is shown, but one conceptual error is made, such as not factoring out -1 when canceling out $2 - x$.
 [2] Appropriate work is shown, but one conceptual error and one computational error are made.
 [1] $-\frac{8}{3}$, 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 incorrect procedure.
 [24] _____
- [6] $-(x-3)$, $-x+3$, or $3-x$, and appropriate work is shown.
 [5] Appropriate work is shown, but one computational, factoring, or simplification error is made.
 [4] Appropriate work is shown, but two computational, factoring, or simplification errors are made.
 or [4] $x-3$, and appropriate work is shown.
 [3] Appropriate work is shown, but three or more computational, factoring, or simplification errors are made.
 or [3] Appropriate work is shown, but one conceptual error is made, such as not multiplying by the multiplicative inverse.
 [2] Appropriate work is shown, but one conceptual error and one computational, factoring, or simplification error are made.
 [1] $-(x-3)$, $-x+3$, or $3-x$, 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 incorrect procedure.
 [25] _____
- [26] C _____
- [27] A _____

[28] A

[29] C

[30] A

[31] B

[32] D

[2] $\frac{2x+3}{x(x+3)}$ or $\frac{2x+3}{x^2+3x}$, and appropriate

work is shown.

[1] Appropriate work is shown, but one computational error is made or the answer is not simplified completely.

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

or [1] $\frac{2x+3}{x(x+3)}$ or $\frac{2x+3}{x^2+3x}$, 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

[33] incorrect procedure.

[34] D

[35] D

[6] $\frac{x-4}{2}$, and appropriate work is shown.

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

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

or [4] Appropriate work is shown, but -1 is not factored out.

[3] Appropriate work is shown, but one conceptual error is made, such as not following the correct order of operations.

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

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

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

or [1] $\frac{x-4}{2}$, 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

[36] incorrect procedure.

[3] 4, and appropriate work is shown.

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

[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] 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

[37] incorrect procedure.

[38] C

[39] D

[40] A

[41] A

[42] A

[43] D

[44] B

[2] 2, and appropriate work is shown.

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

or [1] 2, 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

[45] incorrect procedure.

[2] 2.4 and appropriate work is shown.

[1] The student shows correct use of the distributive property to obtain $2x - 6$ or other appropriate algebraic technique.

or [1] 2.4 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

[46] incorrect procedure.

[2] 2.1, and appropriate work is shown.

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

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

or [1] 2.1, 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

[47] incorrect procedure.

[2] 38 and an appropriate method is shown,

such as $36.64 - (21 + 6.14) = 9.50$ and $\frac{9.50}{.25} =$

38 or an equation such as $21 + .25c + 6.14 = 36.64$.

[1] 38 and no work is shown.

or [1] An appropriate method or equation is shown, but one computational mistake is made.

or [1] The answer of \$9.50 for local calls is found but is not divided by .25.

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

[48] incorrect procedure.

[49] B

[50] D

[2] 5 and appropriate work is shown, such as substituting \$18.11 for p and solving the equation correctly, or trial and error with at least three trials and appropriate checks.

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

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

or [1] 5, but no work or fewer than three trials with appropriate checks are shown.

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

[51] incorrect procedure.

[52] A

[53] C

[54] B

- [2] 1 and -2, and appropriate work is shown.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] Appropriate work is shown, but only one value is found.
or [1] 1 and -2, but no work is shown.
[0] 1 or -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 obviously incorrect procedure.
- [55] _____
- [4] 3 and -5, and appropriate work is shown, such as $x(x + 7) = 5(x + 3)$ or trial and error with at least three trials and appropriate checks for each solution.
[3] Appropriate work is shown, but one computational or factoring error is made.
or [3] Appropriate work is shown, but only one correct solution is found.
or [3] The trial-and-error method is used to find both correct solutions, but only two trials and appropriate checks are shown for each solution.
[2] Appropriate work is shown, but two or more computational or factoring errors are made.
or [2] A correct quadratic equation is written and factored, but no further correct work is shown.
or [2] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but neither solution is found.
[1] A correct quadratic equation is written, but no further correct work is shown.
or [1] 3 and -5, but no work or only one trial with an appropriate check is shown.
[0] 3 or -5, 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 obviously incorrect procedure.
- [56] _____

- [4] 2 and -3, and a correct quadratic equation is shown, such as $x(x + 1) = 6$, and solved algebraically.
[3] The student shows a correct quadratic equation but makes one algebraic error and carries it to solution or no solution for the equation generated.
or [3] Correct work is shown, but only one root is found as the answer.
[2] A correct quadratic equation is used, but two or more errors are made.
or [2] An incorrect quadratic equation of equal difficulty is shown and solved appropriately.
[1] The student cross multiplies but produces only a linear equation that is solved appropriately.
or [1] 2 and -3, but no algebraic work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [57] _____

[4] 6 and -2, and appropriate work is shown, such as an algebraic solution or trial and error with at least three trials and appropriate checks.

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

or [3] Appropriate work is shown, but only one solution is found.

[2] The correct quadratic equation is written in standard form.

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

or [2] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no solution is found.

or [2] An incorrect quadratic equation of equal difficulty is solved appropriately.

[1] $x^2 - 11x - 12 = -7x$, but no further correct work is shown.

or [1] 6 and -2, but no work or only one trial with an appropriate check is shown.

or [1] An incorrect equation of a lesser degree of difficulty is solved appropriately.

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

[0] 6 or -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

[58] obviously incorrect procedure.

[59] B

[2] 1 and 2, $1 < h < 2$, or $1 < 1.854 < 2$, and appropriate work is shown.

[1] $\frac{3}{h} = \frac{h}{3-h}$ is shown, but one

computational error is made.

or [1] The positive root, 1.854, is obtained from the quadratic, but the two correct consecutive integers are not stated.

or [1] 1 and 2, 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

[60] incorrect procedure.

[61] B

[4] $\frac{-3 \pm \sqrt{37}}{7}$ or an equivalent answer, and

appropriate work is shown.

[3] A correct quadratic equation is written and appropriate work is shown, but one computational or simplification error is made.

or [3] An incorrect quadratic equation of equal difficulty is solved appropriately.

[2] A correct quadratic equation is written and appropriate work is shown, but two or more computational or simplification errors are made.

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

or [2] A correct quadratic equation is written in standard form, but no further correct work is shown.

[1] An incorrect equation of a lesser degree of difficulty is solved appropriately.

or [1] $\frac{-3 \pm \sqrt{37}}{7}$ or an equivalent answer, 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

[62] incorrect procedure.

[4] 3 and $\frac{1}{2}$, and appropriate work is shown.

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

or [3] Appropriate work is shown, but only one of the values is found.

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

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

or [2] The correct quadratic equation is written in standard form, but no further correct work is shown.

or [2] An incorrect quadratic equation of equal difficulty is solved appropriately.

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

or [1] An incorrect equation of a lesser degree of difficulty is solved appropriately.

or [1] 3 and $\frac{1}{2}$ but no work is shown.

[0] 3 or $\frac{1}{2}$, 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

[63] obviously incorrect procedure.

[2] 8 or an equivalent answer, and appropriate work is shown.

[1] The denominators are cleared correctly, such as $6(t + 16) + 6t = t(t + 16)$, but the factoring is incorrect, or one error is made using the quadratic formula.

or [1] The denominators are not cleared correctly, but an equation of equal difficulty is solved.

or [1] 8 or an equivalent answer, 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

[64] incorrect procedure.

[6] 3.5, and appropriate work is shown.

[5] Appropriate work is shown, but one computational or rounding error is made.

[4] A substitution error is made, resulting in an incorrect quadratic equation of equal difficulty, but the incorrect equation is solved appropriately.

[3] A correct substitution is made, resulting in the correct quadratic equation in standard form, but the equation is not solved.

[2] A substitution error is made, resulting in an incorrect equation of equal difficulty, and one computational or rounding error is made.

[1] 3.5, 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

[65] incorrect procedure.

[66] B
