Solving Quadratic Equations By Factoring

Solve each equation by factoring.

1) \((3n - 2)(4n + 1) = 0\)

2) \(m(m - 3) = 0\)

3) \((5n - 1)(n + 1) = 0\)

4) \((n + 2)(2n + 5) = 0\)

5) \(3k^2 + 72 = 33k\)

6) \(n^2 = -18 - 9n\)

7) \(7v^2 - 42 = -35v\)

8) \(k^2 = -4k - 4\)

9) \(-2v^2 - v + 12 = -3v^2 + 6v\)

10) \(-4n^2 + 6n - 16 = -5n^2\)
11) $8r^2 + 3r + 2 = 7r^2$

12) $b^2 + b = 2$

13) $10n^2 - 35 = 65n$

14) $3x^2 - 8x = 16$

15) $16n^2 - 114n = -14$

16) $28n^2 = -96 - 184n$

17) $7a^2 + 32 = 7 - 40a$

18) $42x^2 - 69x + 20 = 7x^2 - 8$

**Critical thinking questions. True/False.**

19) If a quadratic equation can be factored and each factor contains only real numbers then there cannot be an imaginary solution.

20) If a quadratic equation cannot be factored then it will have at least one imaginary solution.
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Solve each equation by factoring.

1) \((3n - 2)(4n + 1) = 0\)
   \[\{\frac{2}{3}, -\frac{1}{4}\}\]

2) \(m(m - 3) = 0\)
   \[\{3, 0\}\]

3) \((5n - 1)(n + 1) = 0\)
   \[\{\frac{1}{5}, -1\}\]

4) \((n + 2)(2n + 5) = 0\)
   \[\{-2, -\frac{5}{2}\}\]

5) \(3k^2 + 72 = 33k\)
   \[\{3, 8\}\]

6) \(n^2 = -18 - 9n\)
   \[\{-6, -3\}\]

7) \(7v^2 - 42 = -35v\)
   \[\{-6, 1\}\]

8) \(k^2 = -4k - 4\)
   \[\{-2\}\]

9) \(-2v^2 - v + 12 = -3v^2 + 6v\)
   \[\{3, 4\}\]

10) \(-4n^2 + 6n - 16 = -5n^2\)
    \[\{2, -8\}\]
11) \(8r^2 + 3r + 2 = 7r^2\)
   \([-2, -1]\)

12) \(b^2 + b = 2\)
   \([-2, 1]\)

13) \(10n^2 - 35 = 65n\)
   \(\left\{-\frac{1}{2}, 7\right\}\)

14) \(3x^2 - 8x = 16\)
   \(\left\{-\frac{4}{3}, 4\right\}\)

15) \(16n^2 - 114n = -14\)
   \(\left\{\frac{1}{8}, 7\right\}\)

16) \(28n^2 = -96 - 184n\)
   \(\left\{-\frac{4}{7}, -6\right\}\)

17) \(7a^2 + 32 = 7 - 40a\)
   \(\left\{-\frac{5}{7}, -5\right\}\)

18) \(42x^2 - 69x + 20 = 7x^2 - 8\)
   \(\left\{\frac{7}{5}, -\frac{4}{5}\right\}\)

Critical thinking questions. True/False.

19) If a quadratic equation can be factored and each factor contains only real numbers then there cannot be an imaginary solution. True

20) If a quadratic equation cannot be factored then it will have at least one imaginary solution. False (Example, \(x^2 = 10\))