### Factor

1. \(16x^2 - 25\)
   
   \[(4x-5)(4x+5)\]

2. \(x^2 - 49\)
   
   \[(x+7)(x-7)\]

3. \(4x^2 - 4x\)
   
   \[4x(x-1)\]

4. \(x^2 + 14x + 49\)
   
   \[(x+7)(x+7)\]
   OR
   \[(x+7)^2\]

5. \(6x^2 + 2x - 8\)
   
   \[2(3x^2 + x - 4)\]
   \[2((3x^2 - 3x)(4x - 4))\]
   \[\frac{3x(x-1) + 4(x-1)}{2(3x+4)(x-1)}\]

6. \(3x^2 - 6x + 3\)
   
   \[3(x^2 - 2x + 1)\]
   \[3(x-1)^2\]
   OR
   \[3(x-1)(x-1)\]

7. What are the factors of the expression?
   \(3x^2 + 2x - 8\)
   
   \[\frac{3x^2 - 4x}{x} + \frac{6x - 8}{x}\]
   \[x(3x-4) + 2(3x-4)\]
   \[(x+2)(3x-4)\]

8. What are the factors of the expression?
   \(x^2 + 2x - 8\)
   
   \[(x+4)(x-2)\]

9. What are the x-intercepts for the quadratic equation?
   \(y = 4x^2 + 5x - 9\)
   
   \(0 = 4x^2 + 5x - 9\)
   \[0 = (4x^2 - 4x) + (9x - 9)\]
   \[0 = 4x(x-1) + 9(x-1)\]
   \[0 = (4x+9)(x-1)\]
   \[-9 = 4x + 9\]
   \[x = \frac{36}{4} = \frac{9}{4}\]

10. What are the x-intercepts for the quadratic equation?
    \(y = 7x^2 - x - 8\)
    
    \(0 = 7x^2 - x - 8\)
    \[0 = 7x^2 - 8x + 7x - 8\]
    \[0 = x(7x-8) + 1(7x-8)\]
    \[0 = (x+1)(7x-8)\]
    \[x + 1 = 0\]
    \[x = -1\]
    \[7x - 8 = 0\]
    \[x = \frac{8}{7}\]
    \[\{\frac{3}{4}, 1, -1, \frac{8}{7}\}\]
11. If the solutions of a quadratic equation are \( x = -4 \) and \( x = 3 \), what is the equation in standard form?

\[
y = (x + 4)(x - 3) \\
y = x^2 - 3x + 4x - 12 \\
y = x^2 + x - 12
\]

12. If the solutions of a quadratic equation are \( x = -9 \) and \( x = -4 \), what is the equation in standard form?

\[
y = (x + 9)(x + 4) \\
y = x^2 + 4x + 9x + 36 \\
y = x^2 + 13x + 36
\]

13. If the solutions of a quadratic equation are \( x = 4 \) and \( x = -8 \), what is the quadratic equation in factored form?

\[
y = (x - 4)(x + 8)
\]

14. If the solutions of a quadratic equation are \( x = -\frac{1}{2} \) and \( x = -\frac{8}{5} \), what is the quadratic equation in factored form?

\[
y = \left(x + \frac{1}{2}\right)\left(x + \frac{8}{5}\right) \\
y = (2x + 1)(5x + 8)
\]

Solve the following quadratic equations.

15. \( 16x^2 - 9 = 0 \)

\[
(4x-3)(4x+3) = 0 \\
4x-3 = 0 \\
4x+3 = 0 \\
\{\frac{3}{4}, -\frac{3}{4}\}
\]

16. \( 3x^2 - 6x = 0 \)

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

17. \( 2x^2 + 5x = 18 \)

\[
2x^2 + 5x - 18 = 0 \\
(2x^2 + 9x - 4x - 18) = 0 \\
x(2x+9) - 2(2x+9) = 0 \\
(x-2)(2x+9) = 0 \\
\{x = 2, -\frac{9}{2}\}
\]
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| 18. \(15x^2 - 9x - 6 = -10x\) | \[
\begin{align*}
15x^2 + x - 6 &= 0 \\
(15x^2 + 9x) + (10x - 6) &= 0 \\
3x(5x - 3) + 2(5x - 3) &= 0 \\
(3x + 2)(5x - 3) &= 0 \\
x &= -\frac{2}{3}, \frac{3}{2} \\
\end{align*}
\] |
| 19. \(x^2 = 4x + 32\) | \[
\begin{align*}
x^2 - 4x - 32 &= 0 \\
(x - 8)(x + 4) &= 0 \\
x &= 8, -4 \\
\end{align*}
\] |
| 20. \(2x^2 + 24x + 72 = 0\) | \[
\begin{align*}
2x^2 + 12x + 36 &= 0 \\
2(x + 6)^2 &= 0 \\
x &= -6 \\
\end{align*}
\] |
| 21. \((x - 1)(x + 7)\) | \[
\begin{align*}
x^2 + 7x - x - 7 &= x^2 + 6x - 7 \\
\end{align*}
\] |
| 22. \((6x + 2)(5x + 3)\) | \[
\begin{align*}
30x^2 + 18x + 10x + 6 &= 30x^2 + 28x + 6 \\
\end{align*}
\] |
| 23. \((2x - 9)(2x + 9)\) | \[
\begin{align*}
4x^2 + 18x - 18x - 81 &= 4x^2 - 81 \\
\end{align*}
\] |
| 24. \((5x - 2)^2\) | \[
\begin{align*}
(5x - 2)(5x - 2) &= 25x^2 - 10x - 10x + 4 \\
25x^2 - 20x + 4 \\
\end{align*}
\] |
| 25. \((x - 2)(3x^2 + 4x - 7)\) | \[
\begin{align*}
3x^3 + 4x^2 - 7x - 6x^2 - 8x + 14 &= 3x^3 - 2x^2 - 15x + 14 \\
\end{align*}
\] |
| 26. \((2x + 1)(x^2 - 4x + 5)\) | \[
\begin{align*}
2x^3 - 8x^2 + 10x + 1x^2 - 4x + 5 &= 2x^3 - 7x^2 + 6x + 5 \\
\end{align*}
\] |