

Factoring

Name: _____

Factor the following.

1. $x^2 + 3x + 2$

2. $10x^2 - 5x - 15$

3. $5x^2 + 13x - 30$

4. $4x^2 + 5x + 1$

5. $9x^2 - 16$

6. $12x^2 - 22x - 20$

7. $x^2 + 5x - 6$

8. $6x^2 - 13x + 6$

9. $50x^3 - 98x$

10. $x^2 - x - 2$

11. $3x^2 + 13x + 4$

12. $2x^2 - 14x + 24$

13. $x^2 + x - 30$

14. $8x^2 + 14x - 15$

15. $x^2 - 10x + 16$

16. $9x^3 + 30x^2 + 21x$

17. $4x^2 - 6x - 28$

18. $2x^2 - 10x + 12$

19. $7x^2 + 14x$

20. $100x^2 - 25$

21. $7x^2 - 22x + 3$

22. $x^2 - 10x + 25$

23. $x^2 + x - 12$

24. $2x^2 - 8$

25. $9x^2 + 6x - 3$

26. $3x^3 + 13x^2 - 10x$

27. $21x^2 - 52x - 8$

28. $3x^2 + 15x + 4$

29. $9x^2 - 15x + 4$

30. $x^2 - 9x$

Factoring

Name: ANSWERS

Factor the following.

1. $x^2 + 3x + 2$

$$(x+2)(x+1)$$

2. $10x^2 - 5x - 15$

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

$$5(2x-3)(x+1)$$

3. $5x^2 + 13x - 30$

$$\begin{matrix} 1 & 5 & & 30 & 10 & 15 & 5 \\ 5 & & & 1 & 3 & -2 & 6 \end{matrix}$$

$$(x+15)(5x-2)$$

4. $4x^2 + 5x + 1$

$$\begin{matrix} 2 & 1 \\ 2 & 4 \end{matrix} \quad \begin{matrix} 1 \\ 1 \end{matrix}$$

$$(x+1)(4x+1)$$

5. $9x^2 - 16$

$$(3x+4)(3x-4)$$

6. $12x^2 - 22x - 20$

$$2(6x^2 - 11x - 10)$$

$$\begin{matrix} 2 & 6 & & 1 & 2 & 10 & 5 \\ 3 & & & 10 & 5 & 1 & 2 \end{matrix}$$

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

7. $x^2 + 5x - 6$

$$(x+6)(x-1)$$

8. $6x^2 - 13x + 6$

$$\begin{matrix} 6 & 2 & 1 & 3 \\ 1 & 3 & 6 & 2 \end{matrix}$$

$$(2x-3)(3x-2)$$

9. $50x^3 - 98x$

$$2x(25x^2 - 49)$$

$$2x(5x+7)(5x-7)$$

10. $x^2 - x - 2$

$$(x-2)(x+1)$$

11. $3x^2 + 13x + 4$

$$\begin{matrix} 1 & 3 \\ 3 & 1 \end{matrix} \quad \begin{matrix} 2 & 1 \\ 2 & 4 \end{matrix}$$

$$(3x+1)(x+4)$$

12. $2x^2 - 14x + 24$

$$2(x^2 - 7x + 12)$$

$$2(x-3)(x-4)$$

13. $x^2 + x - 30$

$$(x+6)(x-5)$$

14. $8x^2 + 14x - 15$

$$\begin{matrix} 1 & 2 & & 3 & 1 & 5 & 5 \\ 8 & & & 5 & 15 & 3 & 1 \end{matrix}$$

$$(2x+5)(4x-3)$$

15. $x^2 - 10x + 16$

$$(x-2)(x-8)$$

16. $9x^3 + 30x^2 + 21x$

$$3x(3x^2 + 10x + 7)$$

$$\begin{matrix} 3 \\ 1 \end{matrix} \quad \begin{matrix} 7 & 1 \\ 1 & 7 \end{matrix}$$

$$3x(3x+7)(x+1)$$

17. $4x^2 - 6x - 28$

$$2(2x^2 - 3x - 14)$$

$$\begin{matrix} 1 & 2 \\ 2 & 1 \end{matrix} \quad \begin{matrix} 2 & 1 \\ -7 & 14 \end{matrix}$$

$$2(x+2)(2x-7)$$

18. $2x^2 - 10x + 12$

$$2(x^2 - 5x + 6)$$

$$2(x-2)(x-3)$$

19. $7x^2 + 14x$

$$7x(x+2)$$

20. $100x^2 - 25$

$$(10x+5)(10x-5)$$

21. $7x^2 - 22x + 3$

$$\begin{matrix} 7 & & 1 \\ \downarrow & & \downarrow \\ (7x-1)(x-3) \end{matrix}$$

22. $x^2 - 10x + 25$

$$(x-5)^2$$

23. $x^2 + x - 12$

$$(x+4)(x-3)$$

24. $2x^2 - 8$

$$\begin{matrix} 2(x^2-4) \\ 2(x+2)(x-2) \end{matrix}$$

25. $9x^2 + 6x - 3$

$$\begin{matrix} 3(3x^2+2x-1) \\ \begin{matrix} 3 & & -1 \\ \downarrow & & \downarrow \end{matrix} \end{matrix}$$

$$3(3x-1)(x+1)$$

26. $3x^3 + 13x^2 - 10x$

$$\begin{matrix} x(3x^2+13x-10) \\ \begin{matrix} 1 & 3 & & \\ 3 & & 1 & \\ \downarrow & & \downarrow & \end{matrix} \end{matrix}$$

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

27. $21x^2 - 52x - 8$

$$x = \frac{52 \pm \sqrt{3376}}{42}$$

$$x = \frac{52 \pm 4\sqrt{211}}{42}$$

$$21 \left(x - \frac{26 - 2\sqrt{211}}{21} \right) \left(x - \frac{26 + 2\sqrt{211}}{21} \right)$$

28. $3x^2 + 15x + 4$

$$x = \frac{-15 \pm \sqrt{177}}{6}$$

$$3 \left(x - \frac{-15 + \sqrt{177}}{6} \right) \left(x - \frac{-15 - \sqrt{177}}{6} \right)$$

$$3 \left(x + \frac{15 - \sqrt{177}}{6} \right) \left(x + \frac{15 + \sqrt{177}}{6} \right)$$

29. $9x^2 - 15x + 4$

$$\begin{matrix} 1 & 2 & 4 \\ 9 & 3 & \\ \downarrow & & \downarrow \\ (3x-1)(3x-4) \end{matrix}$$

$$(3x-1)(3x-4)$$

30. $x^2 - 9x$

$$x(x-9)$$