

Graph each interval and write the interval in set-builder notation.

1. $[10,14]$

2. $[-5,5) \cap (6, \infty)$

Graph each interval and write the set in interval notation.

3. $\{x \mid -7 < x \leq -4\}$

4. $\{x \mid -1 < x \leq 1\} \cup \{x \mid x < 2\}$

Evaluate the expression.

5. $-(-5)^4$

6. $12 - 4 \left[\frac{6}{2} - \frac{(-2)^2 - 13}{-2^2} \right]$

7. $10 - 4^3(-2)^2 + 2(2 - 3)$

Simplify the expression.

8. $(-2x^4y^{-2})^{-3} (6x^4y^{-6})^2$

9. $\frac{(3x^{-5}y^2)^{-3}}{(2x^{-2}y^4)^2}$

10. $(x^{-1/6})(x^{3/4})$

11. $\sqrt{175a^5b^9}$

12. $\sqrt[4]{81x^9y^7}$

13. $\sqrt[3]{125x^4y^9z^7}$

Perform the indicated operation and express each result as a polynomial in standard form.

14. $(2x^2 + 14) - (7x^2 + 8x - 27)$

15. $(2y + 15)(2y^3 + 4y^2 - 8)$

16. $(5x - 6)^2$

17. $(x - 6y)(x + 6y)$

Factor the polynomial completely.

18. $x^2 - 12x - 28$

19. $8x^3 - 125$

20. $2x^4 + 9x^3 - 18x^2$

21. $16x^3 + 32x^2 - x - 2$

22. $81x^2 - 121$

23. $3x^3 + 18x^2 + 8x + 48$

Simplify the rational expression.

$$24. \frac{32x^4 - 50}{4x^3 - 12x^2 - 5x + 15}$$

$$25. \frac{9}{x-3} + \frac{2x}{x+1}$$

$$26. \frac{x^2 + 3x - 4}{2x^2 + 4x + 4} \cdot \frac{2x^2 + 4x}{x^2 - 4x + 3}$$

$$27. \frac{2x^2 + 3x - 5}{6x} \div (2x^2 + 5x)$$

$$28. \frac{x^2 - 5}{x^2 + 5x - 14} - \frac{x + 3}{x + 7}$$

Write the complex number in standard form.

$$29. 6 + \sqrt{-90}$$

$$30. -5 - \sqrt{-150}$$

Perform the indicated operation and write answer in simplest form.

$$31. (8 - 3i) + (-13 + 7i)$$

$$32. (4 + 9i) - (15 - 5i)$$

$$33. 5i(7 - 9i)$$

$$34. (3 - 2i)(4 + 10i)$$

$$35. \frac{8 - 12i}{4i}$$

$$36. i^{36}$$

$$37. \frac{1 + 4i}{3 - 2i}$$

$$38. i^{123}$$