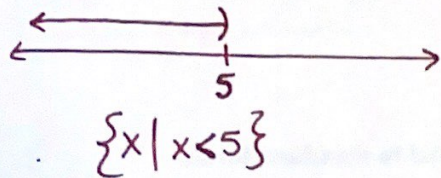
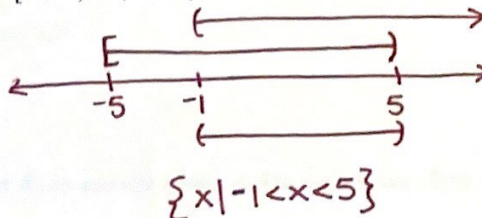


Graph each interval and write the interval in set-builder notation.

1. $(-\infty, 5)$

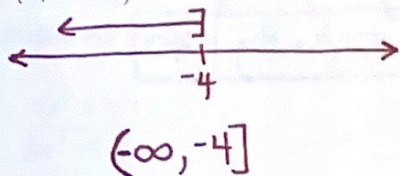


2. $[-5, 5) \cap (-1, \infty)$

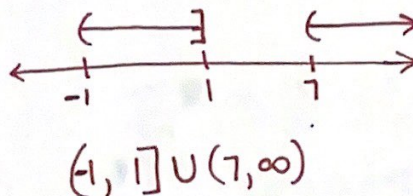


Graph each interval and write the set in interval notation.

3. $\{x | x \leq -4\}$



4. $\{x | -1 < x \leq 1\} \cup \{x | x > 7\}$



Evaluate the expression.

5. -4^4

-256

6. $6 - 2 \left[4 - \frac{(-5)^2 - 29}{-2^2} \right]$

$6 - 2(3)$
 $\boxed{0}$

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

-144

Simplify the expression.

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

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

$\frac{64x^2}{16y^{10}}$

$\boxed{\frac{4x^2}{y^{10}}}$

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

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

$\frac{16x^{-6}y^8}{-8x^{12}y^{-15}}$

$\boxed{\frac{-2y^{23}}{x^{18}}}$

10. $(x^{-1/2})(x^{3/4})$

$x^{1/4}$

$$11. \sqrt{48a^2b^7}$$

$$4ab^3\sqrt{3b}$$

$$12. \sqrt[3]{-135x^2y^7}$$

$$-3y^2\sqrt[3]{5x^2y}$$

$$13. \sqrt[3]{128x^5y^3z^8}$$

$$4xy^2z^2\sqrt[3]{2x^2z^2}$$

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

$$14. (5b^2 - 11) - (3b^2 - 8b - 3)$$

$$2b^2 + 8b - 8$$

$$15. (4y - 5)(3y^3 - 2y^2 - 8)$$

$$12y^4 - 8y^3 - 32y - 15y^3 + 10y^2 + 40$$

$$12y^4 - 23y^3 + 10y^2 - 32y + 40$$

$$16. (2x + 5)^2$$

$$(2x + 5)(2x + 5)$$

$$4x^2 + 20x + 25$$

$$17. (4x - 5y)(4x + 5y)$$

$$16x^2 - 25y^2$$

Factor the polynomial completely.

$$18. x^2 - 2x - 15$$

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

$$19. 3x^2 - 4x - 15$$

$$\begin{array}{r} -45 \\ \frac{3x}{5} \quad \frac{8x}{-93} \\ -95 \end{array}$$

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

$$20. 8x^3 + 60x^2 + 28x$$

$$4x(2x^2 + 15x + 7)$$

$$\begin{array}{r} 14 \\ \frac{2x}{1} \quad \frac{8x}{718} \\ 14 \end{array}$$

$$4x(2x + 1)(x + 7)$$

$$21. 2x^3 + 6x^2 - 5x - 15$$

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

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

$$22. 2x^2 - 7xy - 4y^2 \quad \begin{matrix} -8 \\ -8 \end{matrix}$$

$$\begin{matrix} 2x & 2x & -8 \\ -8y & y & \end{matrix}$$

$$(x-4y)(2x+y)$$

$$23. 6x^3 + 9x^2 + 10x + 15$$

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

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

Simplify the rational expression.

$$24. \frac{4x^3 - 25x}{8x^4 + 125x}$$

$$\frac{x(4x^2 - 25)}{x(8x^3 + 125)}$$

$$\frac{x(2x-5)(2x+5)}{x(2x+5)(4x^2 - 10x + 25)}$$

$$\frac{2x-5}{4x^2 - 10x + 25}$$

$$25. \frac{x^2 - 16}{x^2 - 5x + 4}$$

$$\frac{(x+4)(x-4)}{(x-4)(x-1)}$$

$$\frac{x+4}{x-1}$$

$$\begin{matrix} -12 \\ -34 \\ \frac{2x}{-3} \quad \frac{8x}{25} \end{matrix}$$

$$26. \frac{x^2 - x - 6}{2x^2 + x - 6} \cdot \frac{2x^2 + 7x - 15}{x^2 - 9}$$

$$\frac{(x-3)(x+2)(2x-3)(x+5)}{(x+2)(2x-3)(x+3)(x-3)}$$

$$\frac{x+5}{x+3}$$

$$27. \frac{18x^2 + 18x - 55}{27x^2 - 15x + 2} \div \frac{3x^2 + 29x - 44}{9x^2 - 15x + 4}$$

$$\frac{18x^2 + 18x - 55}{27x^2 - 15x + 2} \cdot \frac{9x^2 - 15x + 4}{3x^2 + 29x - 44}$$

$$\begin{matrix} -990 \\ -1855 \end{matrix}$$

$$\frac{18x^2 + 18x - 55}{(9x-2)(x+11)}$$

$$28. \frac{3x}{x+1} + \frac{2x+5}{x-2}$$

$$\frac{x-2}{x-2} \cdot \frac{3x}{x+1} + \frac{2x+5}{x-2} \cdot \frac{x+1}{x+1}$$

$$\frac{3x^2 - 6x + 2x^2 + 7x + 5}{(x-2)(x+1)}$$

$$\frac{5x^2 + x + 5}{(x-2)(x+1)}$$

$$29. \frac{4x}{x+1} - \frac{x+1}{4x}$$

$$\frac{4x}{4x} \cdot \frac{4x}{x+1} - \frac{x+1}{4x} \cdot \frac{x+1}{x+1}$$

$$\frac{16x^2 - (x^2 + 2x + 1)}{(4x)(x+1)}$$

$$\frac{15x^2 - 2x - 1}{(4x)(x+1)}$$

$$\begin{array}{r} -15 \\ -53 \\ \hline 15x \quad 15x \\ 91 \quad -31 \end{array}$$

$$\frac{(5x+1)(3x-1)}{(4x)(x+1)}$$

$$30. \frac{x}{x+1} + \frac{y}{y+1}$$

$$\frac{y+1}{y+1} \cdot \frac{x}{x+1} + \frac{y}{y+1} \cdot \frac{x+1}{x+1}$$

$$\frac{xy+x+xy+y}{(x+1)(y+1)}$$

$$\frac{2xy+x+y}{(x+1)(y+1)}$$

Write the complex number in standard form.

$$31. 10 + \sqrt{-125}$$

$$10 + 5i\sqrt{5}$$

$$32. 22 - \sqrt{-108}$$

$$22 - 6i\sqrt{3}$$

Perform the indicated operation and write answer in simplest form.

$$33. (7-10i) + (-11+3i)$$

$$-4 - 7i$$

$$34. (7+7i) - (15-8i)$$

$$-8 + 15i$$

$$35. 4i(6-5i)$$

$$24i - 20i^2$$

$$20 + 24i$$

$$36. (5-2i)(3+7i)$$

$$15 + 35i - 6i - 14i^2$$

$$29 + 29i$$

$$37. \frac{6+6i}{3i} \cdot \frac{i}{i}$$

$$\frac{6i+6i^2}{3i^2}$$

$$\frac{-6+6i}{-3}$$

$$2-2i$$

$$38. i^{80} = 1$$

$$39. \frac{5+7i}{5-i} \cdot \frac{5+i}{5+i}$$

$$\frac{25+5i+35i+7i^2}{25-i^2}$$

$$\frac{18+40i}{26}$$

$$= \frac{9+20i}{13}$$

$$40. i^{27} = i^3 = -i$$