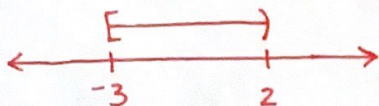


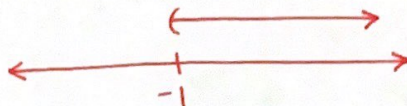
Graph each interval and write the interval in set-builder notation.

1.  $[-3, 2)$



$$\{x \mid -3 \leq x < 2\}$$

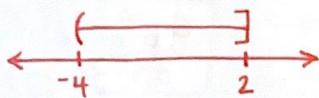
2.  $(-1, \infty)$



$$\{x \mid x > -1\}$$

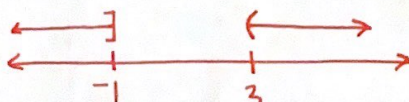
Graph each interval and write the set in interval notation.

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



$$(-4, 2]$$

4.  $\{x \mid x \leq -1\} \cup \{x \mid x > 3\}$



$$(-\infty, -1] \cup (3, \infty)$$

Evaluate the variable expressions for  $x = -2$ ,  $y = 3$ , and  $z = -5$ .

5.  $-3x^3 - 4xy - z^2$

$$-3(-2)^3 - 4(3)(-2) - (-5)^2$$

$$24 + 24 - 25$$

$$\boxed{23}$$

6.  $2x - 3y(4z - x^3)$

$$2(-2) - 3(3)(4(-5) - (-2)^3)$$

$$-4 - 9(-12)$$

$$-4 + 108$$

$$\boxed{104}$$

Simplify the variable expression.

7.  $8 - 3(2x - 5)$

$$8 - 6x + 15$$

$$\boxed{-6x + 23}$$

8.  $5x - 3[7 - 2(6x - 7) - 3x]$

$$5x - 3[7 - 12x + 14 - 3x]$$

$$5x - 3[-15x + 21]$$

$$5x + 45x - 63$$

$$\boxed{50x - 63}$$

Simplify the exponential expression.

9.  $-2^{-5} = \frac{-1}{2^5} = \boxed{-\frac{1}{32}}$

10.  $-\frac{1}{\pi^0} = \boxed{-1}$

11.  $\frac{2}{z^{-4}} = \boxed{2z^4}$

12.  $\frac{x^{-4}}{y^{-3}} = \boxed{\frac{y^3}{x^4}}$

13.  $25^{\frac{1}{2}} = \boxed{5}$

14.  $-27^{\frac{2}{3}} = \boxed{-9}$

15.  $36^{-\frac{1}{2}} = \boxed{\frac{1}{6}}$

16.  $\frac{3}{81^{\frac{1}{4}}} = 3(81^{\frac{1}{4}})$   
 $\boxed{9}$

17.  $(-4x^3y^2)(6x^4y^3)$   
 $\boxed{-24x^7y^5}$

18.  $\frac{12a^5b}{18a^3b^6}$   
 $\boxed{\frac{2a^2}{3b^5}}$

19.  $(-3x^{-2}y^3)^{-3}$   
 $(-3)^3 x^6 y^{-9}$   
 $\boxed{-\frac{x^6}{27y^9}}$

20.  $\left(\frac{2a^2b^{-4}}{6a^{-3}b^6}\right)^{-2}$   
 $\frac{2^{-2}a^{-4}b^8}{6^{-2}a^6b^{-12}}$   
 $\frac{36b^{20}}{4a^{10}}$   
 $\boxed{\frac{9b^{20}}{a^{10}}}$

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

21.  $(2a^2 + 3a - 7) + (-3a^2 - 5a + 6)$   
 $\boxed{-a^2 - 2a - 1}$

22.  $(3x - 2)(2x^2 + 4x - 9)$   
 $6x^3 + 12x^2 - 27x - 4x^2 - 8x + 18$   
 $\boxed{6x^3 + 8x^2 - 35x + 18}$

23.  $(3x - 4)(x + 2)$   
 $3x^2 + 6x - 4x - 8$   
 $\boxed{3x^2 + 2x - 8}$

24.  $(5x + 1)(2x - 7)$   
 $10x^2 - 35x + 2x - 7$   
 $\boxed{10x^2 - 33x - 7}$

Factor the polynomial completely.

25.  $x^2 + 7x - 18$   
 $\boxed{(x+9)(x-2)}$

26.  $2x^2 + 11x + 12$   
 $\frac{2x}{3} \quad \frac{2x}{84}$   
 $\frac{24}{8 \cdot 3}$   
 $\boxed{(2x+3)(x+4)}$

27.  $6x^3y^2 - 12x^2y^2 - 144xy^2$   
 $6xy^2(x^2 - 2x - 24)$   
 $\boxed{6xy^2(x-6)(x+4)}$

28.  $9x^2 - 100$

$$(3x+10)(3x-10)$$

29.  $x^3 + 27$

$$(x+3)(x^2 - 3x + 9)$$

30.  $25x^2 - 30xy + 9y^2$

$$\begin{array}{r} 5x \\ -15y \\ \hline 5x \\ -15y \\ \hline \end{array}$$

$$\begin{array}{r} 225 \\ \hline -15 \quad -15 \end{array}$$

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

Write the complex number in standard form.

31.  $5 + \sqrt{-64}$

$$5 + 8i$$

32.  $2 - \sqrt{-18}$

$$2 - 3i\sqrt{2}$$

Perform the indicated operation and write answer in simplest form.

33.  $(2-3i) + (4+2i)$

$$6 - i$$

34.  $(2+7i) - (6-3i)$

$$-4 + 10i$$

35.  $2i(3-4i)$

$$6i - 8i^2$$

$$8 + 6i$$

36.  $(4-3i)(2+7i)$

$$8 + 28i - 6i - 21i^2$$

$$29 + 22i$$

37.  $\frac{4-6i}{2i} \cdot \frac{i}{i}$

$$\frac{4i - 6i^2}{2i^2}$$

$$\frac{6 + 4i}{-2}$$

$$-3 - 2i$$

38.  $i^{34} = (-1)$

39.  $\frac{2-5i}{3+4i} \cdot \frac{3-4i}{3-4i}$

$$\frac{6 - 23i + 20i^2}{9 - 16i^2}$$

$$\frac{-14 - 23i}{25}$$

40.  $i^{67} = -i$

Simplify the expression.

$$41. \frac{6x^2 - 19x + 10}{2x^2 + 3x - 20} = \frac{(3x-2)(2x-5)}{(x+4)(2x-5)} = \boxed{\frac{3x-2}{x+4}}$$

$$6x^2 - 19x + 10 \quad \begin{matrix} 60 \\ \widehat{-15-4} \end{matrix}$$

$$\frac{36x}{-92} \quad \frac{26x}{75}$$

$$2x^2 + 3x - 20 \quad \begin{matrix} 40 \\ \widehat{8-5} \end{matrix}$$

$$\frac{8x}{24} \quad \frac{2x}{-8}$$

$$43. \frac{15x^2 + 11x - 12}{25x^2 - 9} \div \frac{3x^2 + 13x + 12}{10x^2 + 11x + 3}$$

$$\frac{15x^2 + 11x - 12}{25x^2 - 9} \cdot \frac{10x^2 + 11x + 3}{3x^2 + 13x + 12}$$

$$15x^2 + 11x - 12 \quad \begin{matrix} 60 \\ \widehat{20-9} \end{matrix} \quad 10x^2 + 11x + 3 \quad \begin{matrix} 30 \\ \widehat{65} \end{matrix}$$

$$\frac{36x}{48} \quad \frac{5x}{-93} \quad \frac{50x}{23} \quad \frac{20x}{51}$$

$$(3x+4)(5x-3) \quad (5x+3)(2x+1)$$

$$25x^2 - 9 \quad 3x^2 + 13x + 12 \quad \begin{matrix} 36 \\ \widehat{49} \end{matrix}$$

$$(5x+3)(5x-3) \quad \frac{3x}{4} \quad \frac{8x}{39}$$

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

$$\frac{(3x+4)(5x-3)(5x+3)(2x+1)}{(5x+3)(5x-3)(3x+4)(x+3)}$$

$$\boxed{\frac{2x+1}{x+3}}$$

$$42. \frac{10x^2 + 13x - 3}{6x^2 - 13x - 5} \cdot \frac{6x^2 + 5x + 1}{10x^2 + 3x - 1}$$

$$10x^2 + 13x - 3 \quad \begin{matrix} -30 \\ \widehat{15-2} \end{matrix} \quad 6x^2 + 5x + 1 \quad \begin{matrix} 6 \\ \widehat{23} \end{matrix}$$

$$\frac{210x}{53} \quad \frac{510x}{-21} \quad \frac{26x}{81} \quad \frac{36x}{21}$$

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

$$6x^2 - 13x - 5 \quad \begin{matrix} -30 \\ \widehat{-152} \end{matrix} \quad 10x^2 + 3x - 1 \quad \begin{matrix} -10 \\ \widehat{5-2} \end{matrix}$$

$$\frac{26x}{-15} \quad \frac{36x}{21} \quad \frac{210x}{51} \quad \frac{510x}{-21}$$

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

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

$$\boxed{\frac{2x+3}{2x-5}}$$

$$44. \frac{x}{x^2 - 9} + \frac{2x}{x^2 + x - 12}$$

$$\frac{(x+4)}{(x+4)} \cdot \frac{x}{(x+3)(x-3)} + \frac{2x}{(x+4)(x-3)} \cdot \frac{(x+3)}{(x+3)}$$

$$\frac{x^2 + 4x + 2x^2 + 6x}{(x+4)(x+3)(x-3)}$$

$$\frac{3x^2 + 10x}{(x+4)(x+3)(x-3)}$$

$$\boxed{\frac{x(3x+10)}{(x+4)(x+3)(x-3)}}$$