

### 12.3A: p.788 #3 – 10 all, 51 – 59 all

#### DIVIDING POLYNOMIALS Divide.

3.  $(8x^3 - 12x^2 + 16x) \div 4x$

4.  $(10y^3 + 20y^2 + 55y) \div 5y$

5.  $(12r^4 - 30r^2 - 72r) \div (-6r)$

6.  $(21s^4 + 49s^3 - 35s^2) \div (-7s)$

7.  $(3v^2 - v - 10) \div (v - 2)$

8.  $(7w^2 + 3w - 4) \div (w + 1)$

9.  $(2m^2 - 5m - 12) \div (2m + 3)$

10.  $(6n^2 + 7n - 3) \div (3n - 1)$

#### Write the fraction in simplest form.

51.  $\frac{8}{12}$

52.  $\frac{9}{45}$

53.  $\frac{18}{30}$

#### Simplify the expression.

54.  $4x^4 \cdot (2x^3)^4$

55.  $z^6 \cdot \frac{1}{z^2}$

56.  $\frac{4a^3}{b^4} \cdot \left(\frac{b}{a^2}\right)^{-3}$

57.  $\sqrt{150}$

58.  $\frac{4}{\sqrt{3}}$

59.  $\frac{3}{\sqrt{15}}$

**12.3B: p.788 #11 – 21 all, 60 – 65 all**

**DIVIDING POLYNOMIALS** Divide.

11.  $(a^2 - 5a + 3) \div (a - 1)$

12.  $(c^2 - 2c - 4) \div (c + 4)$

13.  $(-21 - 4p + 3p^2) \div (3 + p)$

14.  $(8q + q^2 + 7) \div (7 + q)$

15.  $(9x + x^2 + 6) \div (6 + x)$

16.  $(4y^2 - 5) \div (2y + 5)$

17.  $(5 - t^2) \div (t - 3)$

18.  $(7 - 8x^2) \div (3 + 2x)$

19. **★ MULTIPLE CHOICE** What is the remainder when you divide  $x^2 + 4x + 9$  by  $x - 4$ ?

**(A)**  $x - 4$

**(B)** 41

**(C)**  $x + 8$


**(D)**  $\frac{41}{x - 4}$

**ERROR ANALYSIS** Describe and correct the error in dividing the polynomials.

20.  $(5x + 6) \div (x + 2)$

$$\begin{array}{r} 5 \\ x + 2 \overline{) 5x + 6} \\ \underline{5x + 10} \phantom{0} \\ -4 \phantom{0} \end{array}$$


$(5x + 6) \div (x + 2) = 5 + \frac{-4}{5x + 6}$



21.  $(8x - 9) \div (x - 3)$

$$\begin{array}{r} 8 \\ x - 3 \overline{) 8x - 9} \\ \underline{8x - 24} \phantom{0} \\ -33 \phantom{0} \end{array}$$

$(8x - 9) \div (x - 3) = 8 + \frac{-33}{x - 3}$



**Factor the polynomial.**

60.  $14x - 8x^2$

61.  $x^2 - 13x + 40$

62.  $-x^2 + 11x - 28$

63.  $12x^2 - 13x + 1$

64.  $-2x^2 - 3x + 20$

65.  $5x^4 - 5x^2$

## 12.4A p.797 #3 – 10 all, 13 – 32 all

**FINDING EXCLUDED VALUES** Find the excluded values, if any, of the expression.

3.  $\frac{4x}{20}$

4.  $\frac{13}{2y}$

5.  $\frac{5}{r+1}$

6.  $\frac{-s}{3s+4}$

7.  $\frac{-m}{4m^2 - 3m + 9}$

8.  $\frac{n+2}{n^2 - 64}$

9.  $\frac{-3}{2p^2 - p}$

10.  $\frac{5q}{q^2 - 6q + 9}$

**SIMPLIFYING EXPRESSIONS** Simplify the rational expression, if possible.  
State the excluded values.

13.  $\frac{10x}{25}$

14.  $\frac{63}{18y}$

15.  $\frac{-48a^2}{16a}$

16.  $\frac{27b^2}{30b^5}$

17.  $\frac{3c+33}{c+11}$

18.  $\frac{d+8}{d-8}$

19.  $\frac{2u-6}{3-u}$

20.  $\frac{v+2}{v^2-4}$

21.  $\frac{2}{f^2-9}$

22.  $\frac{g+4}{g^2-16}$

23.  $\frac{h+3}{h^2-h-12}$

24.  $\frac{j-2}{j^2-6j+8}$

25.  $\frac{-48w}{16w^2-40w}$

26.  $\frac{12y^4}{12y^2+18y}$

27.  $\frac{6z^2-24z}{2z^2-8z}$

28.  $\frac{14x^2+21x}{2x^2+x-3}$

29.  $\frac{s^2+16s+64}{s^2+7s-8}$

30.  $\frac{t^2-4t-45}{2t^2-21t+27}$

31.  $\frac{m+5}{m^3+10m^2+25m}$

32.  $\frac{-n^2-3n+28}{3n^3+9n^2-84n}$

## 12.5A p. 806 #3 – 10, 39 – 46 all

**MULTIPLYING EXPRESSIONS** Find the product.

$$3. \frac{9p^2}{7} \cdot \frac{5}{6p^4}$$

$$4. \frac{5}{8q^6} \cdot \frac{4q^5}{3}$$

$$5. \frac{v^2 + v - 12}{5v + 10} \cdot \frac{-v - 2}{v^2 + 5v + 4}$$

$$6. \frac{y - 2}{-2y^2 - 10y} \cdot \frac{4y^2 + 20y}{y^2 - 4}$$

$$7. \frac{5x}{2x^3 - 17x^2 - 9x} \cdot \frac{4x^2 - 20x - 144}{20}$$

$$8. \frac{r^5}{7r^3 + 56r} \cdot (r^2 + 8)$$

$$9. \frac{-3m}{m^2 - 7m + 10} \cdot (m - 5)$$

$$10. \frac{2n - 6}{3n^2 - 7n - 6} \cdot (3n^2 + 14n + 8)$$

**Add or subtract.**

$$39. \frac{2}{5} + \frac{2}{3}$$

$$40. \frac{3}{8} + \frac{5}{12}$$

$$41. \frac{1}{4} + \frac{5}{6}$$

$$42. \frac{7}{9} + \frac{8}{21}$$

$$43. \frac{7}{8} - \frac{7}{10}$$

$$44. \frac{7}{15} - \frac{1}{4}$$

$$45. \frac{9}{14} - \frac{5}{21}$$

$$46. \frac{5}{17} - \frac{2}{51}$$

## 12.5B p.806 #13 – 21 all, 47 – 52 all

**DIVIDING EXPRESSIONS** Find the quotient.

13.  $\frac{16r^2}{3} \div \frac{12}{5r}$

14.  $\frac{25s^{12}}{18} \div \frac{5s^6}{2}$

15.  $\frac{2w^2 + 5w}{w^2 - 81} \div \frac{w^2}{w + 9}$

16.  $\frac{c^2 + c}{c^2 + c - 30} \div \frac{c - 6}{c^2 - 11c + 30}$

17.  $\frac{a^2 + 3a - 10}{a^2 + 6a - 7} \div \frac{9a^3 - 18a^2}{3a^2 + 18a - 21}$

18.  $\frac{2x^2 - 9x + 9}{35x + 14} \div \frac{-3x^2 + 13x - 12}{15x^2 - 14x - 8}$

19.  $\frac{4k^2 + 4k - 15}{2k - 3} \div (2k + 5)$

20.  $\frac{t^2 - 9t - 22}{5t - 1} \div (5t^2 + 9t - 2)$

21. ★ **MULTIPLE CHOICE** What common factor do you divide out when finding the quotient  $\frac{x^2 - 3x + 2}{x^2 - 2x - 3} \div \frac{x^2 + 4x + 3}{x^2 - 7x + 12}$ ?

Ⓐ  $x - 1$

Ⓑ  $x - 3$

Ⓒ  $x + 1$

Ⓓ  $x + 3$

**Find the sum, difference, or product.**

47.  $(25x^2 - 6x) + (4x^2 - 5)$

48.  $(7x^2 + 5x + 1) + (-6x^2 + 13x)$

49.  $(2x^2 - x + 12) - (3x + 8)$

50.  $(7x^2 + 16) - (8x^3 + 3x^2 - 7)$

51.  $(5x - 6)(4x - 5)$

52.  $(2x + 9)(3x - 7)$

## 12.5C p.811 #1 – 9 all

Simplify the complex fraction.

$$1. \frac{\frac{-9x^5}{7}}{-12x^2}$$

$$2. \frac{\frac{-2}{11x^4}}{18x^4}$$

$$3. \frac{\frac{x^2 + 7x}{2x - 6}}{x^2 - 49}$$

$$4. \frac{\frac{-24x^4}{8x^2}}{-4x^3}$$

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

$$6. \frac{\frac{2x^2 + 5x - 3}{x^2 + 4x + 3}}{15x}$$

$$7. \frac{\frac{x^2 - x - 20}{4}}{\frac{x - 5}{10}}$$

$$8. \frac{\frac{x^2 - 2x - 8}{6x - 3x^2}}{\frac{x^3 + 4x^2}{x^2 - 4}}$$

$$9. \frac{\frac{2x^2 + 5x - 3}{3x^2 + 4x + 1}}{\frac{10x^2 - 5x}{2x^3 - 2x}}$$



## 12.7A p.823 #3 – 13 all, 39 – 50 all

**SOLVING EQUATIONS** Solve the equation. Check your solution.

3.  $\frac{5}{r} = \frac{r}{20}$

4.  $\frac{3}{s-13} = \frac{s}{10}$

5.  $\frac{2}{t} = \frac{10}{t-6}$

6.  $\frac{2}{c+3} = \frac{-5}{c-1}$

7.  $\frac{2m}{m+4} = \frac{3}{m-1}$

8.  $\frac{n-3}{n-6} = \frac{n+1}{n+5}$

9.  $\frac{w}{2} = \frac{15}{w+1}$

10.  $\frac{2x}{4-x} = \frac{x}{x-4}$

11.  $\frac{2y}{y-3} = \frac{24}{y}$

**ERROR ANALYSIS** Describe and correct the error in solving the equation.

12.  $\frac{x+1}{2x+2} = \frac{3}{2x}$

13.  $\frac{4x+1}{8x-1} = \frac{3}{5}$

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

$$(x+1)2x = 3(2x+2)$$

$$2x^2 + 2x = 6x + 6$$

$$2x^2 - 4x - 6 = 0$$

$$2(x-3)(x+1) = 0$$

$$x-3 = 0 \text{ or } x+1 = 0$$

$$x = 3 \text{ or } x = -1$$

The solutions are 3 and -1.

$$\frac{4x+1}{8x-1} = \frac{3}{5}$$

$$5(4x+1) = 3(8x-1)$$

$$20x+1 = 24x-3$$

$$1 = 4x-3$$

$$4 = 4x$$

$$1 = x$$

The solution is 1.

**Write the fraction as a decimal and as a percent. Round decimals to the nearest thousandth. Round percents to the nearest tenth of a percent.**

39.  $\frac{1}{4}$

40.  $\frac{1}{8}$

41.  $\frac{7}{10}$

42.  $\frac{24}{25}$

43.  $\frac{25}{30}$

44.  $\frac{7}{2}$

**Evaluate the expression.**

45.  $(9^2 - 7) \div 2$

46.  $6[4 - (16 - 14)^2]$

47.  $\sqrt{289}$

48.  $\pm\sqrt{1600}$

49.  $\frac{3^2}{3^{-7}}$

50.  $\frac{4^2}{4^5}$