

# REVIEW

## 1. ORDER OF OPERATIONS

Use the order of operations to simplify the expression.

1)  $22 - [8 - (6 - 9)] + (2 - 4)^3$

1) \_\_\_\_\_

2)  $20 - \sqrt{4^2 + 3 \cdot 11}$

2) \_\_\_\_\_

3)  $\sqrt{6^2} - |-1 + 9| + 7$

3) \_\_\_\_\_

## 2. EXPONENTS

Divide the expression using the quotient rule.

4)  $\frac{-36x^{13}y^8}{6x^8y^4}$

4) \_\_\_\_\_

5)  $\frac{-14x^{11}y^{12}z^7}{7x^7y^6z^6}$

5) \_\_\_\_\_

Simplify the expression using the products to powers rule.

6)  $(5x^{-3}y^9z^{-9})^{-3}$

6) \_\_\_\_\_

Simplify the expression using the quotients-to-powers rule.

7)  $\left(\frac{3p^2v^2}{s^4}\right)^2$

7) \_\_\_\_\_

Simplify the exponential expression.

8)  $\frac{3^{-7}x^{-6}y^2}{3^{-4}x^{-9}y^4}$

8) \_\_\_\_\_

9)  $\left(\frac{12x^{-3}y^{-2}z^4}{3xy^{-2}z^{-4}}\right)^{-2}$

9) \_\_\_\_\_

## 3. LINEAR EQUATIONS

Solve the equation.

10)  $8y + 4(6 + y) = 3(y - 9) + 10y$

10) \_\_\_\_\_

11)  $\frac{x+9}{6} = 1 - \frac{x-3}{3}$

11) \_\_\_\_\_

12)  $23 - x = [5 - (2 - 9)] - (5 - 7)^3$

12) \_\_\_\_\_

$$13) -[5(d + 2) - 6[3d - 2(3d + 8)] - 7] = -18d + 126$$

13) \_\_\_\_\_

#### 4. FACTORIG

Factor completely, or state that the trinomial is prime.

$$14) 5y^4 + 40y^3 + 60y^2$$

14) \_\_\_\_\_

Factor completely, or state that the trinomial is prime.

$$15) 3x^4 + 3x^3 - 60x^2$$

15) \_\_\_\_\_

$$16) 3x^3y^3 - 6x^3y^2 - 24x^3y$$

16) \_\_\_\_\_

Factor the trinomial by grouping, or state that the trinomial is prime.

$$17) 15y^2 - 32y + 16$$

17) \_\_\_\_\_

$$18) 20x^2 + 7x - 6$$

18) \_\_\_\_\_

$$19) 7x^2 + 8xy + y^2$$

19) \_\_\_\_\_

Factor any difference of two squares, or state that the polynomial is prime. Assume any variable exponents represent whole numbers.

$$20) x^2y^2 - 64$$

20) \_\_\_\_\_

$$21) x^{16} - y^{12}$$

21) \_\_\_\_\_

$$22) (x - 4)^2 - y^2$$

22) \_\_\_\_\_

Factor completely, or state that the polynomial is prime. Assume any variable exponents represent whole numbers.

$$23) 1 - 81y^4$$

23) \_\_\_\_\_

Factor using the formula for the sum or difference of two cubes.

$$24) x^3 - 8$$

24) \_\_\_\_\_

$$25) 125x^3 - 1$$

25) \_\_\_\_\_

$$26) a^3b^3 + 27$$

26) \_\_\_\_\_

$$27) 27x^6 + 125y^6$$

27) \_\_\_\_\_

## 5. RATIONAL EXPRESSIONS

Simplify the rational expression. If the rational expression cannot be simplified, so state.

28)  $\frac{6x^2 + 16x + 10}{2x + 2}$  28) \_\_\_\_\_

29)  $\frac{5x^2 + 15x^3}{4x + 12x^2}$  29) \_\_\_\_\_

30)  $\frac{y^3 - 216}{y - 6}$  30) \_\_\_\_\_

31)  $\frac{y^2 - 4y - 21}{y^2 - 5y - 24}$  31) \_\_\_\_\_

Simplify the complex fraction.

32)  $\frac{\frac{7}{3r-1} - 7}{\frac{7}{3r-1} + 7}$  32) \_\_\_\_\_

33)  $\frac{\frac{36s^2 - 9t^2}{st}}{\frac{6}{t} - \frac{3}{s}}$  33) \_\_\_\_\_

## 6. RADICALS

Use properties of rational exponents to simplify the expression. Assume that any variables represent positive numbers.

34)  $(r^{1/9} s^{1/9})^2$  34) \_\_\_\_\_

35)  $(36x^{10}y^6)^{1/2}$  35) \_\_\_\_\_

36)  $\frac{(3x^{5/6})^3}{x^{1/6}}$  36) \_\_\_\_\_

37)  $(x^{-1/6}y^{10/9})^{1/4}$  37) \_\_\_\_\_

## 7. QUADRATIC EQUATIONS

Use factoring to solve the quadratic equation.

38)  $x^2 + 3x - 40 = 0$  38) \_\_\_\_\_

$$39) 8x^2 + 30x + 25 = 0$$

39) \_\_\_\_\_

$$40) x^2 - 36 = 35x$$

40) \_\_\_\_\_

$$41) (x + 2)^2 + 4(x - 3) = 7x + 12$$

41) \_\_\_\_\_

$$42) 5x(x + 5) = (4x - 8)(x + 5)$$

42) \_\_\_\_\_

**Use the quadratic formula to solve the equation.**

$$43) x^2 + 5x - 36 = 0$$

43) \_\_\_\_\_

$$44) 2x^2 - 3x - 5 = 0$$

44) \_\_\_\_\_

$$45) 4x^2 + 8x + 2 = 0$$

45) \_\_\_\_\_

$$46) 4x^2 = -10x - 1$$

46) \_\_\_\_\_

**Solve the equation by the square root property. If possible, simplify radicals or rationalize denominators. Express imaginary solutions in the form  $a + bi$ .**

$$47) 5x^2 = 75$$

47) \_\_\_\_\_

$$48) 576x^2 + 361 = 0$$

48) \_\_\_\_\_

$$49) 11x^2 - 5 = 0$$

49) \_\_\_\_\_

## 8. FACTORABLE EQUATIONS

**Use factoring to solve the polynomial equation.**

$$50) x^3 - 4x^2 - 12x = 0$$

50) \_\_\_\_\_

$$51) x^3 + 6x^2 - x - 6 = 0$$

51) \_\_\_\_\_

$$52) 5x^4 - 180x^2 = 0$$

52) \_\_\_\_\_

$$53) 3x^4 = 24x$$

53) \_\_\_\_\_

$$54) 5x^3 + 4x^2 = 20x + 16$$

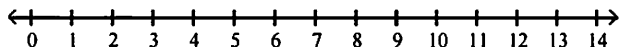
54) \_\_\_\_\_

## 9. LINEAR INEQUALITIES

Solve the inequality. Other than  $\emptyset$ , graph the solution set on a number line.

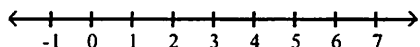
55)  $-3x - 4 \geq -4x + 3$

55) \_\_\_\_\_



56)  $6x + 2 + 3x < 6 + 7x + 2$

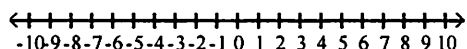
56) \_\_\_\_\_



Solve the linear inequality. Other than  $\emptyset$ , graph the solution set on a number line.

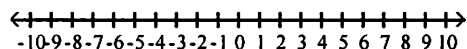
57)  $5(4x + 5) - 4x < 4(6 + 4x) - 6$

57) \_\_\_\_\_



58)  $-7x \leq -7(x - 3)$

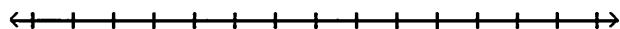
58) \_\_\_\_\_



Solve the inequality. Express your answer using interval notation.

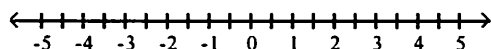
59)  $-16 \leq -3x - 1 < -10$

59) \_\_\_\_\_



60)  $0 \leq \frac{2x + 3}{3} < 3$

60) \_\_\_\_\_



## 10. EQUATIONS INVOLVING ABSOLUTE VALUE

Solve the equation.

61)  $|3x + 8| = 4$

61) \_\_\_\_\_

62)  $|8x + 5| + 6 = 10$

62) \_\_\_\_\_

63)  $\left| \frac{3x + 6}{2} \right| = 3$

63) \_\_\_\_\_

64)  $|3(x + 1) + 6| = 18$

64) \_\_\_\_\_

65)  $|x^2 - 4x - 4| = 8$

65) \_\_\_\_\_

66)  $|2x^2 - x - 1| = 3$

66) \_\_\_\_\_

**11. INEQUALITIES INVOLVING ABSOLUTE VALUE**

**Solve the inequality. Express your answer using interval notation.**

67)  $|2x - 4| - 6 > -9$

67) \_\_\_\_\_

68)  $|5x - 1| \geq 5$

68) \_\_\_\_\_

69)  $|5 - 7x| > 9$

69) \_\_\_\_\_

**Solve the inequality. Express your answer using interval notation.**

70)  $|x + 1| < 0$

70) \_\_\_\_\_

**12. LITERAL EQUATIONS**

**Solve the equation for the specified variable.**

71)  $P = \frac{A}{1 + rt}$  for r

71) \_\_\_\_\_

72)  $A = \frac{1}{2}h(B + b)$  for b

72) \_\_\_\_\_

73) The gas law:  $\frac{PV}{T} = \frac{Pv}{t}$  for P

73) \_\_\_\_\_

74)  $P = \frac{A}{1 + rt}$  for t

74) \_\_\_\_\_

75)  $P = \frac{Fd}{t}$  for t

75) \_\_\_\_\_

### 13. LONG DIVISION OF POLYNOMIALS

Divide.

76)  $(9x^2 - 53x - 6) \div (x - 6)$  76) \_\_\_\_\_

77)  $(-25x^3 - 40x^2 - 31x + 7) \div (-5x - 4)$  77) \_\_\_\_\_

78)  $(x^2 - 121) \div (x - 11)$  78) \_\_\_\_\_

### 14. SYNTHETIC DIVISION OF POLYNOMIALS

Use synthetic division to divide.

79)  $(x^2 - 16) \div (x + 4)$  79) \_\_\_\_\_

80)  $(6x^3 + 21x^2 - 10x + 8) \div (x + 4)$  80) \_\_\_\_\_

81)  $(x^4 + 256) \div (x - 4)$  81) \_\_\_\_\_

### 15. RATIONAL EXPONENTS; RADICAL EXPRESSIONS

Use properties of rational exponents to simplify the expression. Assume that any variables represent positive numbers.

82)  $(x^{-1/6}y^{10/9})^{1/4}$  82) \_\_\_\_\_

83)  $\frac{(3x^{5/6})^3}{x^{1/6}}$  83) \_\_\_\_\_

84)  $\frac{x^{1/5} x^{2/7}}{x^{1/6}}$  84) \_\_\_\_\_

Use rational exponents to simplify the radical. If rational exponents appear after simplifying, write the answer in radical notation.

85)  $\frac{\sqrt[5]{5}}{\sqrt[7]{5}}$  85) \_\_\_\_\_

86)  $\sqrt[8]{\sqrt[6]{xy}}$  86) \_\_\_\_\_

87)  $\frac{\sqrt[4]{y^3}}{16\sqrt[3]{y^8}}$  87) \_\_\_\_\_