

Name \_\_\_\_\_

# **Honors Modern Geometry**

# **Comprehensive Algebra Review**

## Algebra Review Packet

The problems in this packet are intended to review what you should already know from an Algebra I Course. The skills selected are those that we will be using in the study of Honors Modern Geometry. If you get stuck on any question you can ask another mathematics teacher for assistance or research the information on the Internet. This background information will appear at various times throughout this course and you will be expected to know it.

1. Evaluate  $(x-3)^2 + 5$  for  $x = 10$ .

2. Evaluate  $(y-1)^2 + (y+6)^2$  for  $y = 4$ .

Solve each of the following:

3.  $3x - 12 = 2x$

4.  $-\frac{7}{8}x + 7 = \frac{3}{8}x - 3$

5.  $0.6x - 1.8 = 1.2x$

6. Three fifths of the automobiles entering the city each morning will be parked in city parking lots. These cars fill 3654 parking spaces. How many cars enter the city each morning?

7. Solve  $A = \pi r^2$  for  $r$ .

8. Solve  $A = 2\pi r^2 + 2\pi rh$  for  $h$ .

9. After election results of 378 votes were tallied, the new student council president won by a margin of 5 to 4. How many votes did she receive?

Solve each of the following.

10. What percent of 52 is 13?

11. What percent of 86 is 129?

12. 60 is what percent of 720?

13. 12 is what percent of 0.5?

Solve each of the following inequalities.

14.  $x - 9 < 12$

15.  $3a + 8 \geq -5 + 2a$

16.  $6y \leq 3$

17.  $7y + 2 > 5y - 8$

18. The width of a rectangle is 15 cm. What length will make the area at least 225 cm?

Simplify each of the following expressions

19.  $\frac{4m^5}{m^3}$

20.  $x^2y^{-3}$

21.  $(2y^6)^3$

22.  $\left(\frac{x}{y^3}\right)^2$

23.  $(3x^5y^4)^3$

24.  $(-3ab^2c)(-4b^2c^4)$

25.  $(2m^3 - 9) + (5m^3 - 10m^2 + 10)$

26.  $(-6a^2 - a + 3) - (a^3 - 10a^2 + a + 3)$

Find each of the following products.

27.  $(4b - 1)(4b + 3)$

28.  $(2m + 3)(m - 6)$

29.  $(7y + 6)(7y - 6)$

30.  $(a + 2)^2$

31.  $(a - 3)^2$

32.  $(3a + 5)^2$

Factor completely.

33.  $m^3 - m$

34.  $49x^2 - 64$

35.  $m^4 - 1$

36.  $2x^2 + 13x - 99$

37.  $7m^2 - 8m + 1$

38.  $9x^2 - 24x + 16$

Graph each equation in the coordinate plane.

39.  $x + y = 5$

40.  $2x + 3y = -1$

41.  $x = 3$

42.  $y = -2$

Write the equation of the line for the given conditions.

43. The line contains (0, 10) and is parallel to the x-axis.

44. the line contains the origin and the point (-3, 3).

45. The line with slope  $-\frac{2}{3}$  and crosses the x-axis at -7.

46. The line with x-intercept 6 and y-intercept -1.

Solve each system of equations.

$$\begin{aligned} 47. \quad y &= x - 6 \\ x + y &= -2 \end{aligned}$$

$$\begin{aligned} 48. \quad \frac{1}{2}x - 2y &= 9 \\ 4x + 3y &= 7 \end{aligned}$$

Solve each of the following and graph the solution on the number line.

$$49. \quad |x| < 4$$

$$50. \quad |x - 6| \leq 10$$

Simplify each of the following radical expressions. Assume all variables are nonnegative.

$$51. \quad \sqrt{49}$$

$$52. \quad -\sqrt{81}$$

$$53. \quad \sqrt{150}$$

$$54. \quad \sqrt{9y}$$

$$55. \quad \sqrt{y^7}$$

$$56. \quad \sqrt{8x^4y^4}$$

$$57. \quad \sqrt{\frac{1}{6}}$$

$$58. \quad \frac{\sqrt{5}}{\sqrt{18}}$$

$$59. \quad \frac{\sqrt{x^2}}{\sqrt{27}}$$

$$60. \quad \sqrt{27} + \sqrt{108}$$

Solve each of the following equations.

$$61. \quad 3x^2 = 30$$

$$62. \quad 3x^2 - 7x = 0$$

$$63. \quad x^2 + 4 = 4x$$

$$64. \quad 6x^2 + x - 2 = 0$$

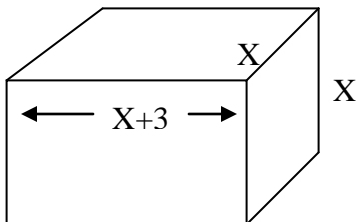
$$65. \quad (x - 3)^2 = 0$$

$$66. \quad x^2 - 10x - 4 = 0$$

67. The difference between two numbers is 14. Three times the larger number is 45 less than four times the smaller number. What are the two numbers?

68. In a rectangle the length is 3 more than the width. The area of the rectangle is 180 square centimeters. What are the dimensions of the rectangle?

69.



The figure to the left has a surface area of 144 square inches. What is the value of X?