Name_____ Date_____

1. Solve $\frac{1}{5}x + \frac{2}{5}x - 12 = 3$.

2. Solve $-6(8 - 7x) = 5(7x - 4)$

3. How many solutions does the equation $-\frac{1}{5}(25x + 10) = -2 - 5x$ have?

4. The vertices of a triangle are $A(-4, 3)$, $B(-1, -2)$, and $C(-3, -2)$. Translate the triangle 3 units right and 1 unit down. What are the coordinates of the image?

5. The vertices of a triangle are $A(-4, -3)$, $B(-3, -1)$, and $C(-1, -2)$. Reflect the triangle in the y-axis. What are the coordinates of the image?

6. The vertices of a triangle are $A(3, 4)$, $B(4, 2)$, and $C(4, -1)$. Rotate the triangle 90° counterclockwise about the origin. What are the coordinates of the image?

7. $\triangle MNP$ is the image of $\triangle JKL$ after a translation 2 units up. $\triangle JKL$ is scalene.
   (a) Is the measure of $\angle K$ equal to the measure of $\angle P$?
   (b) Is the length of side KL equal to the length of side PM?

8. Line h and line t are parallel. Both lines are rotated 90° counterclockwise about the origin. Are the images of the lines parallel?

9. You translate a line 2 units left. Is the image of the line still a line?

10. The vertices of a triangle are $A(3, -3)$, $B(6, 3)$, and $C(-6, -6)$. Dilate the triangle using a scale factor of $\frac{1}{3}$. What are the coordinates of the image?

11. Describe a sequence of rigid motions between the triangles.

12. Describe a similarity transformation between the triangles.
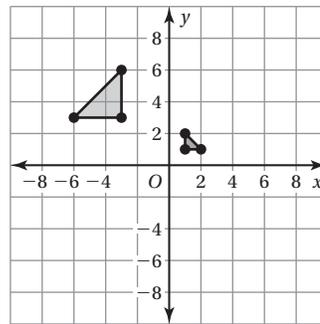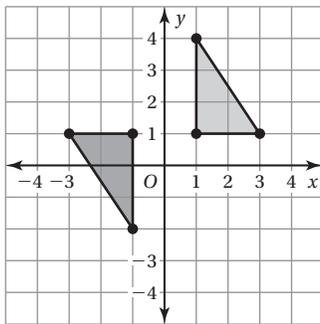
13. Find the measures of the numbered angles.

14. Find the values of x.

15. Find the values of x.
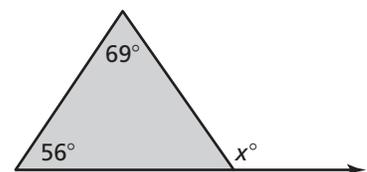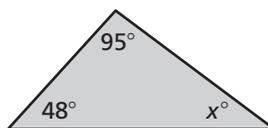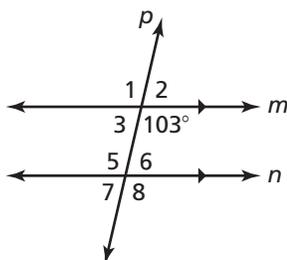
Grade 8

Post-Course Test (continued)

16. Triangle A has interior angle measures of 108°, $x°$, and 37°. Triangle B has interior angle measures of 108°, $y°$, and 35°. Are the triangles similar?

17. The profit y (in dollars) for a business from selling x hats is represented by $y = 9x$. Graph the equation.

18. The distance y (in miles) that Train A travels in x hours is represented by the equation $y = 64x$. The distance that Train B travels is represented by a graph of a line through the points (0, 0) and (1, 60). Which train is faster?

19. Solve the system by graphing.

$y = 3x + 4$

$5x + y = -4$

**20.** Solve the system algebraically.

$y = -5x + 7$

$7x - 6y = -5$

21. You buy 4 health bars and 2 health drinks for $14. Your friend buys 5 health bars and 3 health drinks for $19. How much does each item cost?

22. Determine the number of solutions of the system.

$x + 4y = 6$

$x + 4y = 5$

23. Identify any outliers, gaps, or clusters.

24. Describe the relationship between the data in the scatter plot.
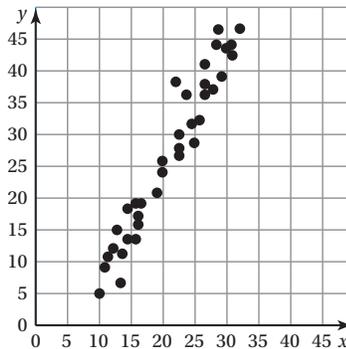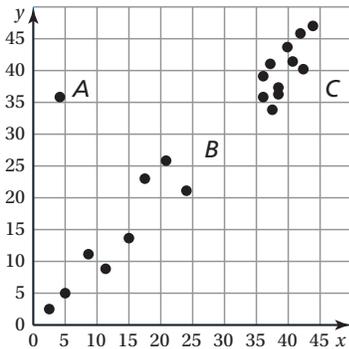
25. Make a scatter plot of the data and draw a line of fit. Write an equation of the line of fit.

x	10	20	15	20	40	20	10	40	5	25
y	15	20	20	25	45	15	5	40	5	25

Grade 8 **Post-Course Test** (continued)

26. You collect data about the number of hours spent studying x and the test scores y for several students. An equation of a line of fit for the data is $y = 5x + 61$. Interpret the slope and y-intercept.

27. You randomly survey middle school students and high school students about whether they prefer baseball or soccer. The results are shown in the tables. Create a two-way table that includes the marginal frequencies.

Middle School	
Baseball	**Soccer**
60	25

High School	
Baseball	**Soccer**
66	51

28. Do the ordered pairs $(2, 20)$, $(5, 15)$, $(12, 19)$, and $(14, 13)$ represent a function?

29. Graph the function $y = -\frac{5}{4}x + 2$.

30. Two arcades charge an entrance fee and a fee per game. At Arcade A, the total cost y (in dollars) of playing x games is represented by the linear function $y = 0.75x + 5$. The table shows the total cost for playing x games at Arcade B. Which arcade has a higher fee per game? a higher entrance fee?

Number of Games, x	0	4	8	12
Total Cost, y	8	10	12	14

31. Determine whether each equation represents a nonlinear function.

    a. $y = 5(x + 1)$ **b.** $y = -\frac{4}{x^2}$ **c.** $y = x^2 + 6$ **d.** $y = x^2$

32. Create a graph for each situation. (a) The temperature increases slowly at first and then more quickly. (b) The temperature decreases at a constant rate.

Simplify the expression. Write your answer as a power.

33. $4^5 \cdot 4^2$ 34. $(2^2)^7$ 35. $(xy)^4$ 36. $\frac{5^8}{5^4}$

37. Evaluate the expression $\frac{2^6}{2^7}$.

38. The population of Country A is about 12,402,000 and the population of Country B is about 1,216,000,000. Approximately how many times greater is the population of Country B than the population of Country A?

39. Write the number 231,000 in scientific notation.

Grade 8 **Post-Course Test** (continued)

40. A calculator display shows 9.2E9. Write the number in standard form.

Evaluate the expression. Write your answer in scientific notation.

**41.** $(7.7 \times 10^{-5}) - (6.4 \times 10^{-5})$

42. $(5 \times 10^{-2}) \times (7 \times 10^{-4})$

43. Evaluate $\sqrt{4}$.

44. Solve $4x^2 - 39 = 105$.

45. Find a.

46. Find the slant height.

25 in.

a

20 in.

13.6 mm

10.2 mm
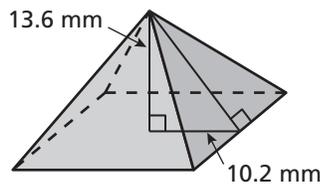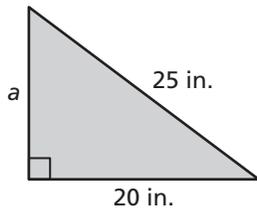
47. Your friend's house is 6.4 miles north and 12 miles west of your bank. How far is your friend's house from your bank?

48. Evaluate $\sqrt[3]{\dfrac{1}{343}}$.

49. Solve $\dfrac{1}{2}x^3 = 256$.

50. Write each number as a fraction.
   a. $0.1\overline{6}$ **b.** 0.16 **c.** $0.8\overline{3}$

51. Write $0.\overline{19}$ as a fraction in simplest form.

52. Approximate $\sqrt{74}$ to the nearest tenth. Plot the number on a number line.

53. Which number is greater, $\sqrt{8}$ or $\sqrt[3]{93}$?

54. Approximate the distance between $(-8, 0)$ and $(-4, 7)$ to the nearest tenth.

55. Tell whether a triangle with the side lengths 65 feet, 72 feet, and 97 feet is a right triangle.

56. The volume of a cylindrical container is 151 cubic centimeters and the height is 3 centimeters. Approximate the radius of the container to the nearest whole number.

57. A cone has a radius of 12 meters and a height of 31 meters. Approximate the volume of the cone to the nearest tenth.

58. The volume of a spherical ball is $36,000\pi$ cubic centimeters. Find the radius of the ball.