

## Summer 2024

### Honors Geometry Summer Packet

All students entering Honors Geometry must complete this packet before school starts. The use of apps or websites such as PhotoMath or Mathway, or the use of AI such as ChatGPT to solve problems is strictly prohibited and is a violation of the Honor Code. On the first day of school, you will be asked to sign an Honor Code statement that you completed this packet, but it will not be collected. You may ask for help from family, friends, or a tutor, and you may use the websites listed below to re-learn things you have forgotten, but the work in the packet must be your own.

On the first day of school, your packet will be checked for completion and you will be asked to sign an Honor Code statement that it is your own work, but the packet will not be collected. We will not be reviewing this during class, so as you work through the packet, take notes on things you had to look up. You will be putting this packet and those notes at the front of your Geometry binder for reference.

The expectation in this course is that you show all of your work, and that your work be done neatly so that others can easily follow it. Make sure your 9's don't look like 4's, and your x's and y's are distinctly different. No work = no credit, and work that is not neat and legible will not be graded in this course.

Calculators are discouraged when working on this packet. We will not use calculators for at least the first quarter of the school year.

We recommend the following websites if you need more help with any of the topics:

[www.khanacademy.org](http://www.khanacademy.org)

[www.purplemath.com](http://www.purplemath.com)

[www.mathbitsnotebook.com](http://www.mathbitsnotebook.com)

[www.mathantics.com](http://www.mathantics.com)

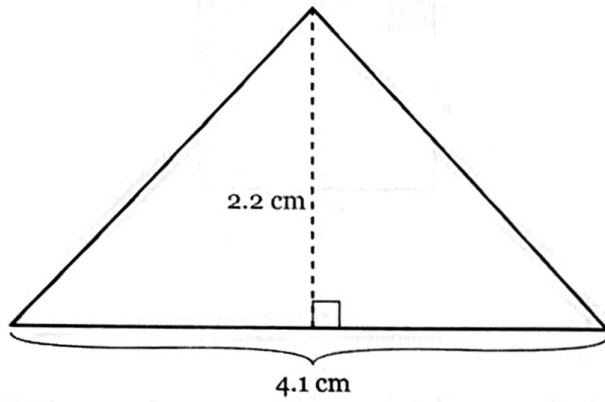
The following materials will be required:

- Graphing calculator (TI-84 Plus or TI-84 Plus CE). Casio calculators are not permitted.
- Graph paper and loose leaf paper
- 3-ring binder (can be shared with other subjects as long as Geometry has its own section - there will be many handouts)
- Pencils
- Highlighters (2-3 colors)
- 2 colored pens for correcting work
- Colored pencils
- 6-inch ruler and scissors
- Two black thick Expo markers with you at all times (no colors)

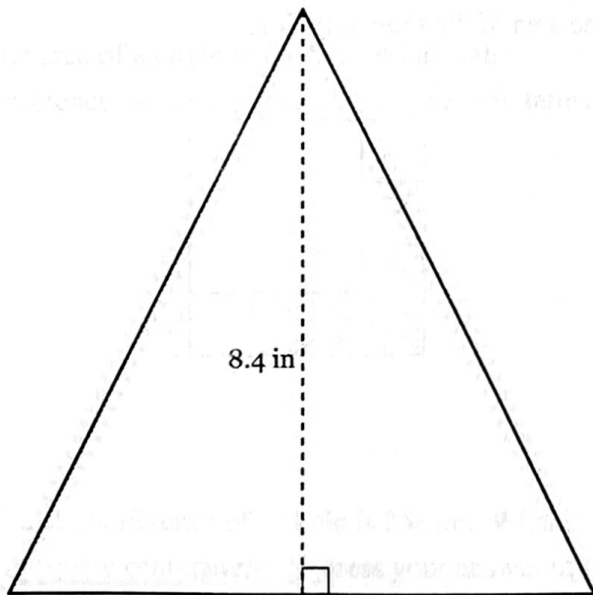
**Good luck, pace yourself, and have a great summer!**

Name: \_\_\_\_\_

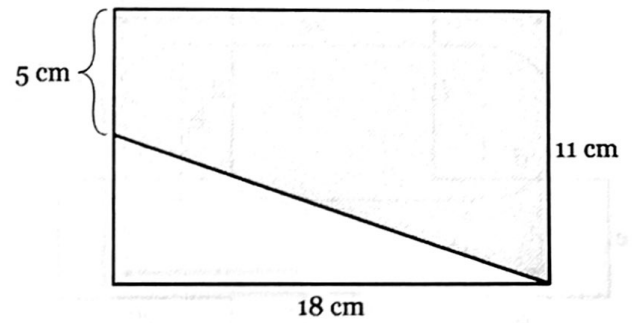
1. What is the area, in square centimeters, of the shape below?



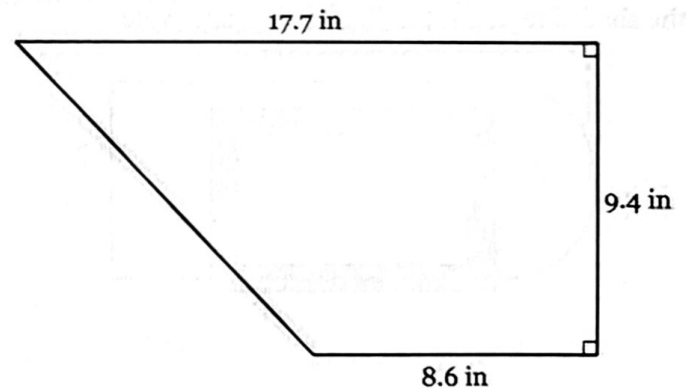
2. The area of the triangle below is 35.7 square inches. What is the length of the base?



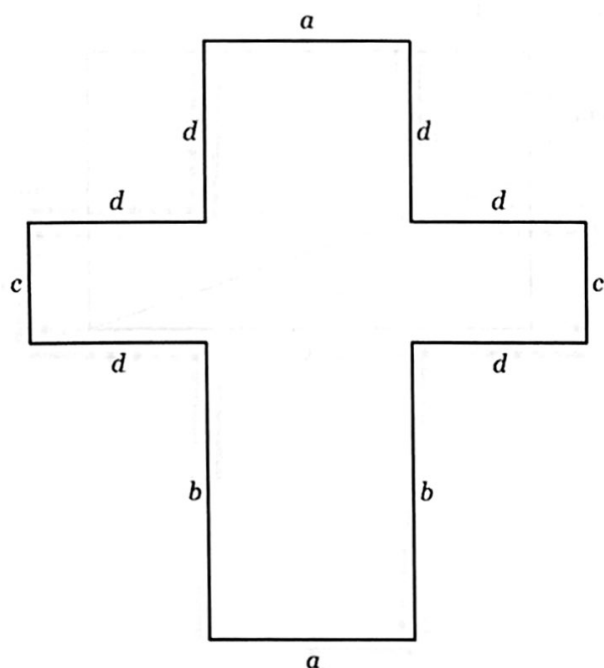
3. What is the area, in square centimeters, of the shaded part of the rectangle below?



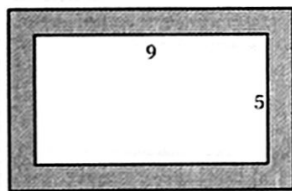
4. What is the area, in square inches, of the trapezoid below?



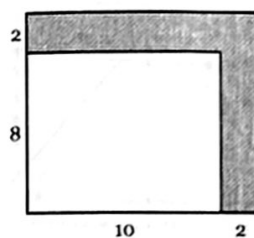
5. Write an expression that represents the perimeter of the figure below. Write your answer in simplified form.



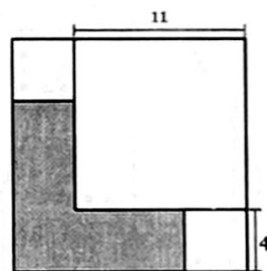
6. One rectangle is "framed" within another. Find the area of the shaded region if the "frame" is 1 unit wide.



7. Given the two rectangles below. Find the area of the shaded region.



8. All of the quadrilaterals in the shape below are squares. Find the area of the shaded region.



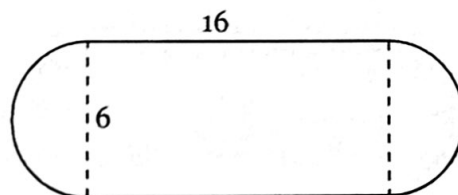
9. The diameter of a circle is 20 in. Find its area in terms of  $\pi$ .

10. The radius of a circle is 16 cm. Find its area to the nearest whole number.

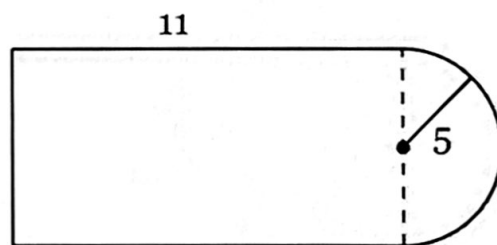
11. The area of a circle is  $121\pi \text{ ft}^2$ . What is the circumference, in feet? Express your answer in terms of  $\pi$ .

12. The circumference of a circle is  $25\pi \text{ cm}$ . What is the area, in square centimeters? Express your answer in terms of  $\pi$ .

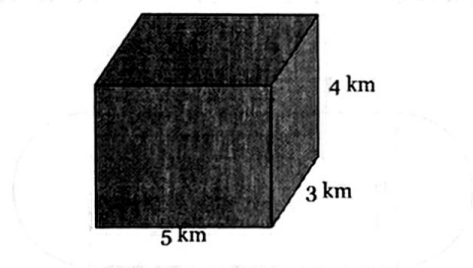
13. Find the Area of the figure below, composed of a rectangle and two semicircles. Round to the nearest tenths place.



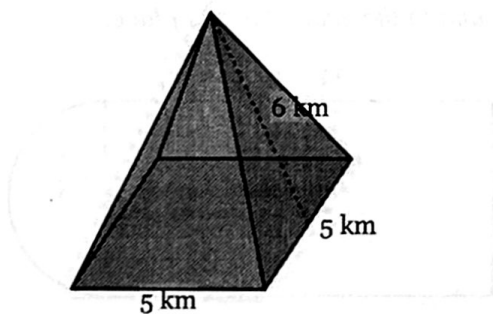
14. Find the Area of the figure below, composed of a rectangle and a semicircle. The radius of the circle is shown. Round to the nearest tenths place.



15. Find the surface area of the rectangular prism.



16. Find the surface area of a square pyramid with side length 5 km and slant height 6 km.

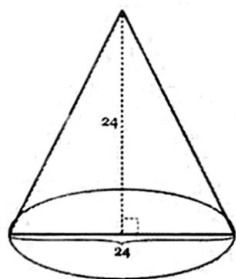


17. A rectangular prism has a length of 9cm, a height of 17cm, and a width of 16cm. What is its volume, in cubic cm?

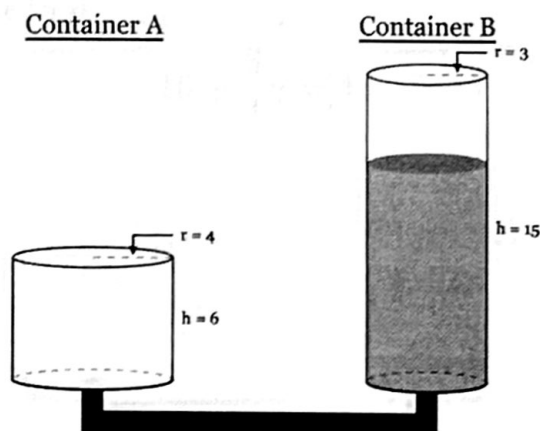
18. A cube has an edge length of 2 feet. What is its volume, in cubic feet?

19. A cylinder has a base diameter of 8 feet and a height of 7 feet. What is its volume in cubic feet, *to the nearest tenths place*?

20. Find the volume of the right cone below. Round your answer to the nearest tenth if necessary.

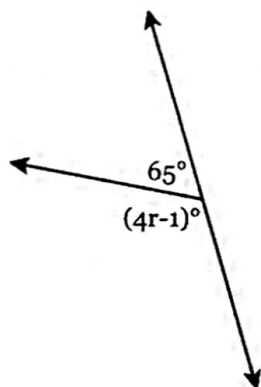


21. Two containers designed to hold water are side by side, both in the shape of a cylinder. Container A has a radius of 4 feet and a height of 6 feet. Container B has a radius of 3 feet and a height of 15 feet. Container A is full of water and the water is pumped into Container B until Container A is empty. *To the nearest tenth*, what is the percent of Container B that is full after the pumping is complete?

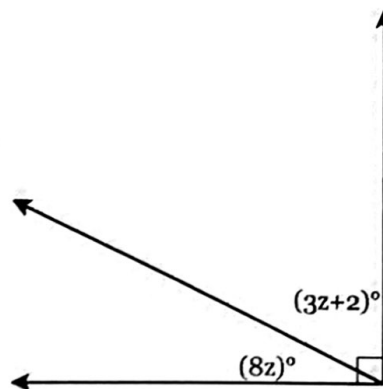


22. Sarah decides to estimate the volume of an orange by modeling it as a sphere. She measures its radius as 4.8 cm. Find the orange's volume in cubic centimeters. Round your answer to the nearest tenth if necessary.

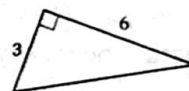
23. Solve for the value of  $r$ .



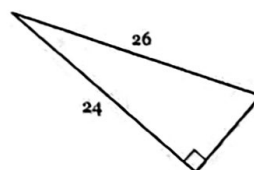
24. Solve for the value of  $z$ .



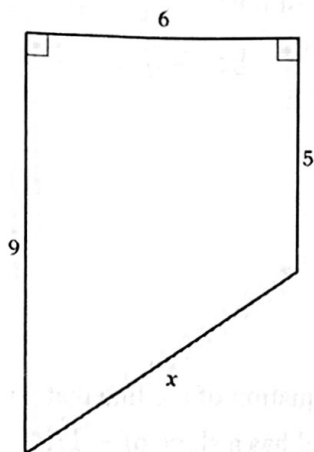
25. Find the length of the third side. If necessary, round to the nearest tenth.



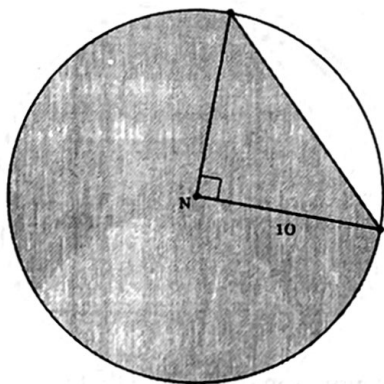
26. Find the length of the third side. If necessary, round to the nearest tenth.



27. Solve for  $x$  to the nearest tenth.



28. Find the area of the shaded region of circle  $N$  below.  
Round your answer to the nearest tenth if necessary.



29. Solve for  $c$ .

$$-49 = 2c - 29$$

30. Solve for  $y$ .

$$10 + \frac{3}{4}y = 43$$

31. Solve for  $x$ :

$$4x - 10(-x - 1) = 6(x - 2)$$

32. Solve for  $x$ .

$$\frac{x}{18} = \frac{2}{3}$$

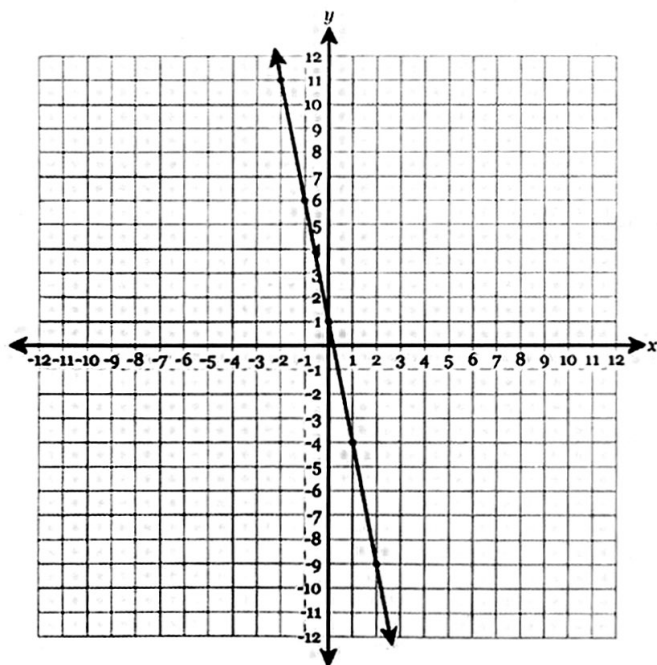


33. Solve for  $x$ .

$$\frac{x+3}{2} = \frac{x+8}{7}$$

34. What is the slope of the line that passes through the points  $(8, -6)$  and  $(5, -1)$ ? Write your answer in simplest form.

35. Write the equation of the line in fully simplified slope-intercept form.



36. Put the following equation of a line into slope-intercept form, simplifying all fractions.

$$5x + y = -4$$

37. What is the equation of the line that passes through the point  $(-1, 2)$  and has a slope of  $-1$ ?

38. What is the equation of the line that passes through the point  $(-3, 4)$  and has an undefined slope?

39. What is the equation of the line that passes through the point  $(-5, 4)$  and has a slope of 0?

40. What is an equation of the line that passes through the points  $(-5, 7)$  and  $(5, -5)$ ?

41. Solve the following equation for  $d$ .

$$m = \frac{g}{d} + 3$$

42. Solve the following equation for  $m$ .

$$n = -Q + \frac{1}{3}Tm$$

43. Given  $f(x) = -3x^2 - 3x$ , find  $f(-6)$

44. Given  $f(x) = -x^2 + 6x$ , find  $f(-4)$

45. Express in simplest radical form:  $\sqrt{72}$

46. Express in simplest radical form:  $\sqrt{54}$

47. Express in simplest radical form:  $\sqrt{20}$

48. Express in simplest radical form:  $\sqrt{40}$

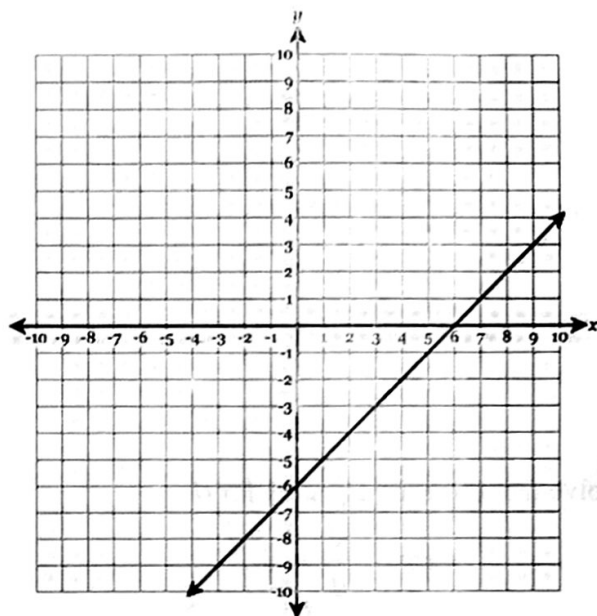
49. Express in simplest radical form:  $\sqrt{32}$

50. What is the product of  $6\sqrt{3}$  and  $3\sqrt{6}$  in simplest radical form?

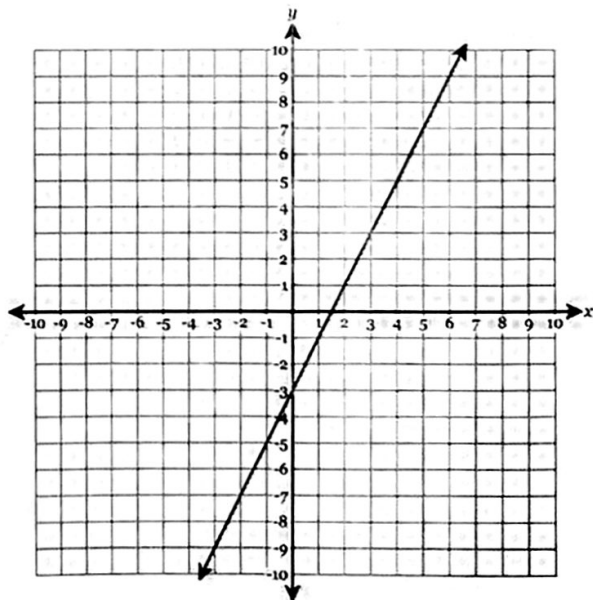
51. Express in simplest radical form.

$$-10\sqrt{45} + 5\sqrt{20}$$

52. Use a straightedge to graph a line that is parallel to the given line. Be sure to pass through lattice points (the corners of the grid lines). Determine the slopes of both the given line and the one you graphed in simplest form.



53. Use a straightedge to graph a line that is perpendicular to the given line. Be sure to pass through lattice points (the corners of the grid lines). Determine the slopes of both the given line and the one you graphed in simplest form.



54. Which equation represents a line which is parallel to the line  $8x + y = -3$ ?

- A.  $y = \frac{1}{8}x + 1$       B.  $y = 8x + 7$   
C.  $y = -\frac{1}{8}x + 5$       D.  $y = -8x - 6$

55. Which equation represents a line which is perpendicular to the line  $5x + 4y = 24$ ?

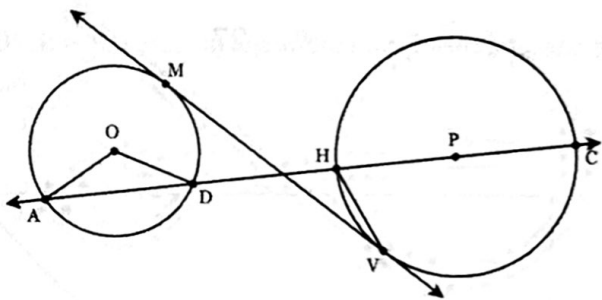
- A.  $y = -\frac{5}{4}x + 5$   
 B.  $y = \frac{5}{4}x - 2$   
 C.  $y = \frac{4}{5}x + 1$   
 D.  $y = -\frac{4}{5}x - 1$

**56.** Find the slope of a line perpendicular to the line whose equation is  $3x - 3y = 18$ . Fully simplify your answer.

57. Find the slope of a line parallel to the line whose equation is  $x + y = -6$ . Fully simplify your answer.

58. What is an equation of the line that passes through the point  $(-5, 2)$  and is perpendicular to the line  $x - 2y = 2$ ?

**59.** Which of the segments below is a radius?



- A.  $\overline{HV}$   
B.  $\overline{MV}$   
C.  $\overline{HC}$   
D.  $\overline{OD}$

60. Factor completely:  $2x^2 - 9x + 4$

61. Factor completely:  $5x^2 + 49x - 10$

62. Factor completely:  $2x^4 - 26x^3 + 24x^2$

63. Factor completely:  $48x^8 - 27$

64. Factor completely:  $3x^2 - x - 2$

65. Factor completely:  $6x^2 + 19x + 3$

66. Factor completely:  $-4x^2 + 16x + 84$

67. Factor completely:  $4x^3 - 12x^2 - 72x$

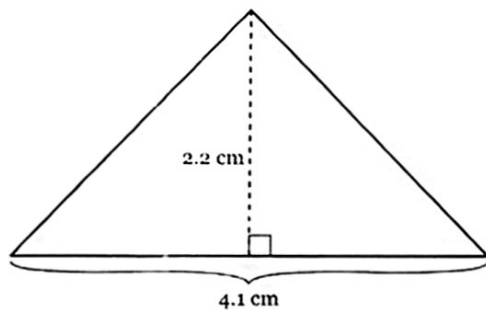
68. Factor completely:  $x^2 - 64$

69. Factor completely:  $9x^2 - 49$

70. Express as a trinomial:  $(2x + 6)(x - 6)$

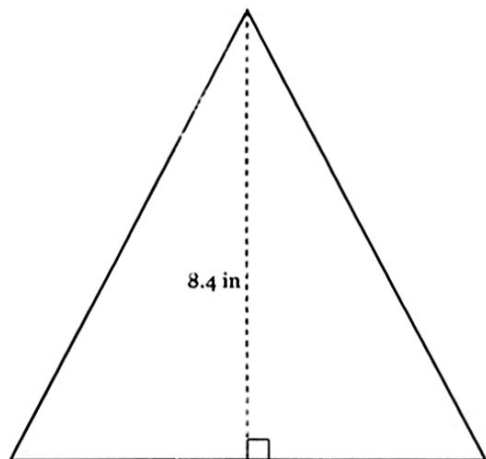
71. Express as a trinomial:  $(2x - 4)(2x - 9)$

1. What is the area, in square centimeters, of the shape below?



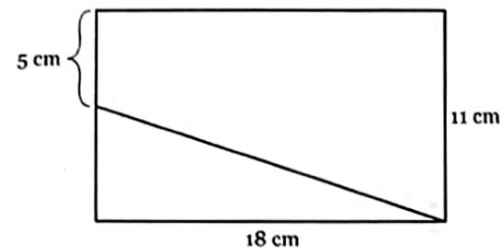
$$A = 4.51 \text{ cm}^2$$

2. The area of the triangle below is 35.7 square inches. What is the length of the base?



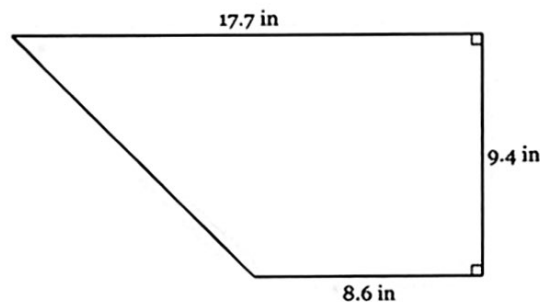
$$b = 8.5 \text{ in}$$

3. What is the area, in square centimeters, of the shaded part of the rectangle below?



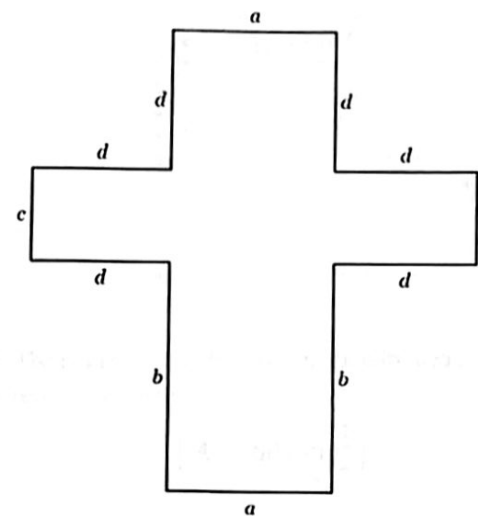
$$A = 144 \text{ cm}^2$$

4. What is the area, in square inches, of the trapezoid below?



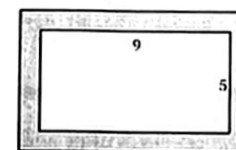
$$A = 123.61 \text{ in}^2$$

5. Write an expression that represents the perimeter of the figure below. Write your answer in simplified form.



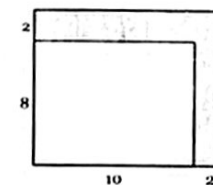
$$P = 2a + 2b + 2c + 6d$$

6. One rectangle is "framed" within another. Find the area of the shaded region if the "frame" is 1 unit wide.



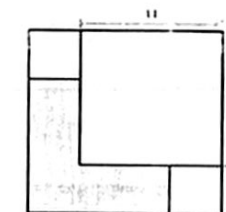
$$32 \text{ units}^2$$

7. Given the two rectangles below. Find the area of the shaded region.



$$40 \text{ units}^2$$

8. All of the quadrilaterals in the shape below are squares. Find the area of the shaded region.



$$72 \text{ units}^2$$

9. The diameter of a circle is 20 in. Find its area in terms of  $\pi$ .

$$A = 100\pi \text{ in}^2$$

10. The radius of a circle is 16 cm. Find its area to the nearest whole number.

$$A = 804 \text{ cm}^2$$

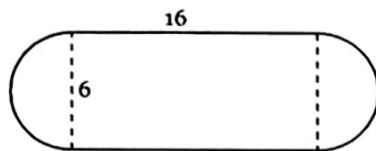
11. The area of a circle is  $121\pi \text{ ft}^2$ . What is the circumference, in feet? Express your answer in terms of  $\pi$ .

$$C = 22\pi \text{ ft}$$

12. The circumference of a circle is  $25\pi \text{ cm}$ . What is the area, in square centimeters? Express your answer in terms of  $\pi$ .

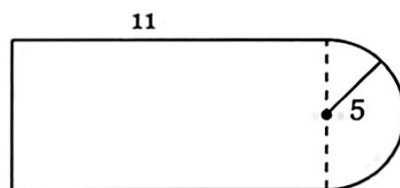
$$A = 156.25\pi \text{ cm}^2$$

13. Find the Area of the figure below, composed of a rectangle and two semicircles. Round to the nearest tenths place.



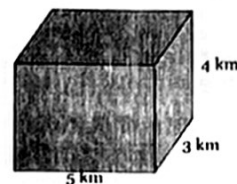
$$124.3$$

14. Find the Area of the figure below, composed of a rectangle and a semicircle. The radius of the circle is shown. Round to the nearest tenths place.



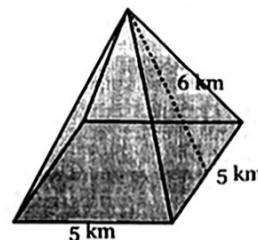
$$149.3$$

15. Find the surface area of the rectangular prism.



$$94 \text{ km}^2$$

16. Find the surface area of a square pyramid with side length 5 km and slant height 6 km.



$$85 \text{ km}^2$$

17. A rectangular prism has a length of 9cm, a height of 17cm, and a width of 16cm. What is its volume, in cubic cm?

$$V = 2448 \text{ cm}^3$$

18. A cube has an edge length of 2 feet. What is its volume, in cubic feet?

$$V = 8 \text{ feet}^3$$

19. A cylinder has a base diameter of 8 feet and a height of 7 feet. What is its volume in cubic feet, to the nearest tenths place?

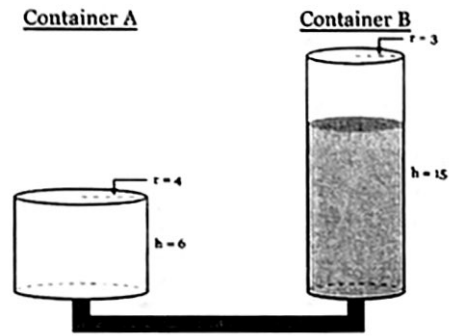
$$V = 351.9 \text{ feet}^3$$

20. Find the volume of the right cone below. Round your answer to the nearest tenth if necessary.



$$3619.1 \text{ units}^3$$

21. Two containers designed to hold water are side by side, both in the shape of a cylinder. Container A has a radius of 4 feet and a height of 6 feet. Container B has a radius of 3 feet and a height of 15 feet. Container A is full of water and the water is pumped into Container B until Container A is empty. To the nearest tenth, what is the percent of Container B that is full after the pumping is complete?

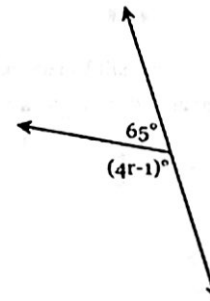


After the pumping, Container B is 71.1% full.

22. Sarah decides to estimate the volume of an orange by modeling it as a sphere. She measures its radius as 4.8 cm. Find the orange's volume in cubic centimeters. Round your answer to the nearest tenth if necessary.

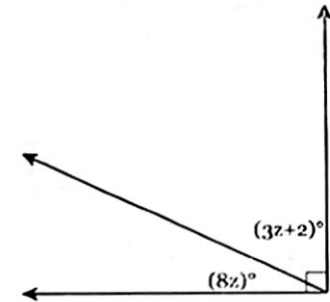
$$463.2 \text{ cm}^3$$

23. Solve for the value of  $r$ .



$$r = 29$$

24. Solve for the value of  $z$ .



$$z = 8$$

25. Find the length of the third side. If necessary, round to the nearest tenth.



$$6.7$$

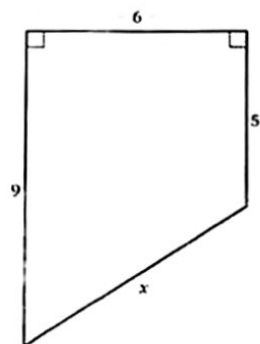
26. Find the length of the third side. If necessary, round to the nearest tenth.



$$10$$

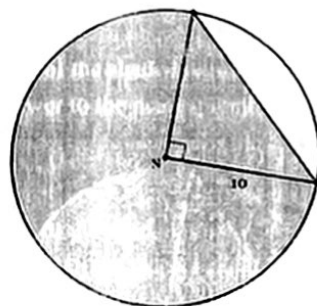


27. Solve for  $x$  to the nearest tenth.



$$x \approx 7.2$$

28. Find the area of the shaded region of circle  $N$  below. Round your answer to the nearest tenth if necessary.



$$285.6 \text{ units}^2$$

29. Solve for  $c$ .

$$-49 = 2c - 29$$

$$c = -10$$

30. Solve for  $y$ .

$$10 + \frac{3}{4}y = 43$$

$$y = 44$$

31. Solve for  $x$ :

$$4x - 10(-x - 1) = 6(x - 2)$$

$$x = -2.75$$

32. Solve for  $x$ .

$$\frac{x}{18} = \frac{2}{3}$$

$$12$$

33. Solve for  $x$ .

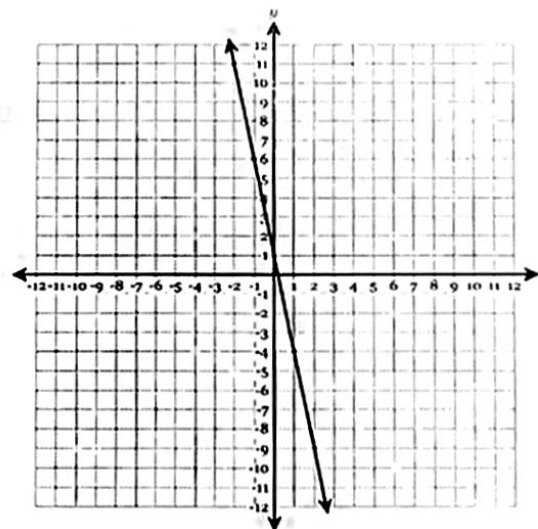
$$\frac{x+3}{2} = \frac{x+8}{7}$$

$$x = -1$$

34. What is the slope of the line that passes through the points  $(8, -6)$  and  $(5, -1)$ ? Write your answer in simplest form.

$$-\frac{5}{3}$$

35. Write the equation of the line in fully simplified slope-intercept form.



$$y = -5x + 1$$

36. Put the following equation of a line into slope-intercept form, simplifying all fractions.

$$5x + y = -4$$

$$y = -5x - 4$$

37. What is the equation of the line that passes through the point  $(-1, 2)$  and has a slope of  $-1$ ?

$$y = -x + 1$$

38. What is the equation of the line that passes through the point  $(-3, 4)$  and has an undefined slope?

$$x = -3$$

39. What is the equation of the line that passes through the point  $(-5, 4)$  and has a slope of  $0$ ?

$$y = 4$$

40. What is an equation of the line that passes through the points  $(-5, 7)$  and  $(5, -5)$ ?

$$y = -\frac{6}{5}x + 1$$

41. Solve the following equation for  $d$ .

$$m = \frac{g}{d} + 3$$

$$d = \frac{g}{m - 3}$$

42. Solve the following equation for  $m$ .

$$n = -Q + \frac{1}{3}Tm$$

$$\frac{3(n + Q)}{\frac{T}{3}} = m$$

43. Given  $f(x) = -3x^2 - 3x$ , find  $f(-6)$

$$-90$$

44. Given  $f(x) = -x^2 + 6x$ , find  $f(-4)$

$$-40$$

45. Express in simplest radical form:  $\sqrt{72}$

$$6\sqrt{2}$$

46. Express in simplest radical form:  $\sqrt{54}$

$$3\sqrt{6}$$

47. Express in simplest radical form:  $\sqrt{20}$

$$2\sqrt{5}$$

48. Express in simplest radical form:  $\sqrt{40}$

$$2\sqrt{10}$$

49. Express in simplest radical form:  $\sqrt{32}$

$$4\sqrt{2}$$

50. What is the product of  $6\sqrt{3}$  and  $3\sqrt{6}$  in simplest radical form?

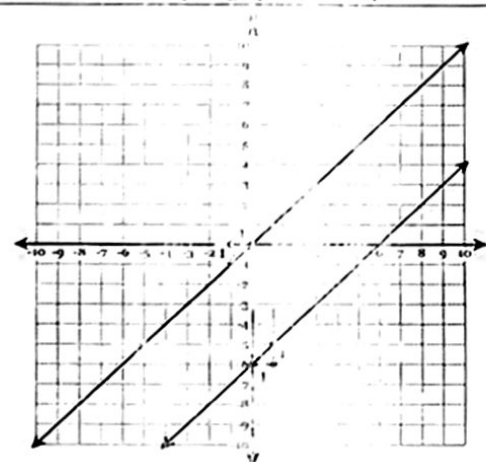
$$54\sqrt{2}$$

51. Express in simplest radical form.

$$-10\sqrt{45} + 5\sqrt{20}$$

$$-20\sqrt{5}$$

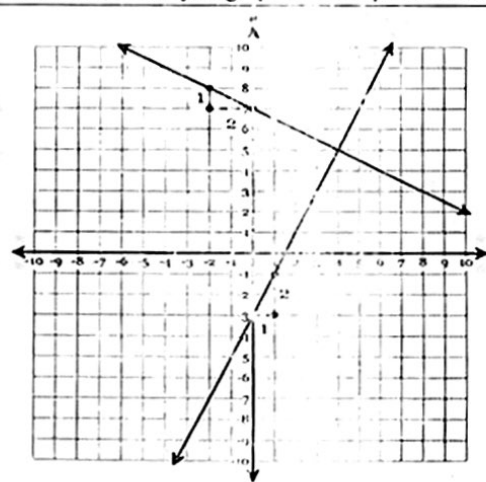
52. Use a straightedge to graph a line that is parallel to the given line. Be sure to pass through lattice points (the corners of the grid lines). Determine the slopes of both the given line and the one you graphed in simplest form.



(many possible parallel lines could be made)

Original Slope: 2 Parallel Slope: 1

53. Use a straightedge to graph a line that is perpendicular to the given line. Be sure to pass through lattice points (the corners of the grid lines). Determine the slopes of both the given line and the one you graphed in simplest form.



(many possible perpendicular lines could be made)

Original Slope: 2 Perpendicular Slope:  $-\frac{1}{2}$

54. Which equation represents a line which is parallel to the line  $8x + y = -3$ ?

- A.  $y = \frac{1}{8}x + 1$       B.  $y = 8x + 7$   
 C.  $y = -\frac{1}{8}x + 5$       **D.  $y = -8x - 6$**

55. Which equation represents a line which is perpendicular to the line  $5x + 4y = 24$ ?

- A.  $y = -\frac{5}{4}x + 5$   
 B.  $y = \frac{5}{4}x - 2$   
**C.  $y = \frac{4}{5}x + 1$**   
 D.  $y = -\frac{4}{5}x - 1$

56. Find the slope of a line perpendicular to the line whose equation is  $3x - 3y = 18$ . Fully simplify your answer.

**Slope of a perpendicular line:  $-1$**

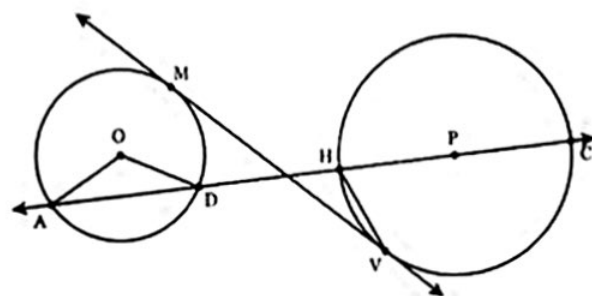
57. Find the slope of a line parallel to the line whose equation is  $x + y = -6$ . Fully simplify your answer.

**Slope of a parallel line:  $-1$**

58. What is an equation of the line that passes through the point  $(-5, 2)$  and is perpendicular to the line  $x - 2y = 2$ ?

**$y = -2x - 8$**

59. Which of the segments below is a radius?



- A.  $\overline{HV}$   
 B.  $\overline{MV}$   
 C.  $\overline{HC}$   
**D.  $\overline{OD}$**

60. Factor completely:  $2x^2 - 9x + 4$

**$(2x - 1)(x - 4)$**

61. Factor completely:  $5x^2 + 49x - 10$

**$(5x - 1)(x + 10)$**

62. Factor completely:  $2x^4 - 26x^3 + 24x^2$

**$2x^2(x - 12)(x - 1)$**

63. Factor completely:  $48x^8 - 27$

**$3(4x^4 + 3)(4x^4 - 3)$**

64. Factor completely:  $3x^2 - x - 2$

**$(3x + 2)(x - 1)$**

65. Factor completely:  $6x^2 + 19x + 3$

**$(6x + 1)(x + 3)$**

66. Factor completely:  $-4x^2 + 16x + 84$

**$-4(x + 3)(x - 7)$**

67. Factor completely:  $4x^3 - 12x^2 - 72x$

**$4x(x + 3)(x - 6)$**

68. Factor completely:  $x^2 - 64$

**$(x + 8)(x - 8)$**

69. Factor completely:  $9x^2 - 49$

**$(3x + 7)(3x - 7)$**

70. Express as a trinomial:  $(2x + 6)(x - 6)$

**$2x^2 - 6x - 36$**

71. Express as a trinomial:  $(2x - 4)(2x - 9)$

**$4x^2 - 26x + 36$**