# Pre-Algebra Final Exam Review

**Multiple Choice**
*Identify the letter of the choice that best completes the statement or answers the question.*

**Solve the equation.**

____ 1. $78 = -2(m + 3) + m$
a. –28 b. –42 c. –72 d. –84

____ 2. $\frac{1}{4}y - 3 = 9$
a. 48 b. 3 c. 36 d. 24

____ 3. $\frac{4}{9}n + 6 = \frac{4}{3}$
a. $10\frac{1}{2}$ b. $16\frac{1}{2}$ c. $-4\frac{2}{3}$ d. $-10\frac{1}{2}$

____ 4. $\frac{5}{4}(a - 8) = \frac{2}{3}$
a. $6\frac{14}{15}$ b. $7\frac{1}{15}$ c. $8\frac{8}{15}$ d. $8\frac{2}{3}$

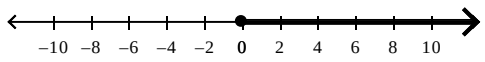
____ 5. $12 + 0.35x = 20.05$
a. 91.5 b. 57.3 c. 2.8175 d. 23

____ 6. Mandy and 2 friends bought some mechanical pencils at a special sale. They divided some of the pencils equally among themselves and then gave 3 to Mandy's little brother. At that time they had 19 pencils left.
Solve the equation $\frac{p}{3} - 3 = 19$ to find the number of pencils $p$ that they bought at the sale.
a. 48 pencils b. 57 pencils c. 66 pencils d. 22 pencils

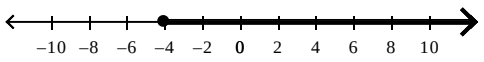
____ 7. The 9 officers of the Student Council are going on a trip to an amusement park. Each student must pay an entrance fee plus $5 for meals. The total cost of the trip is $225. Solve the equation $9(e + 5) = 225$ to find the cost $e$ of the entrance fee for each student.
a. $20 b. $45 c. $25 d. $14

**Solve and graph the inequality.**

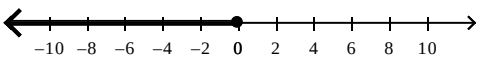
____ 8. $-x - 4x \leq 0$
a. $x \geq 0$



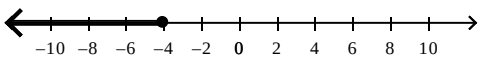

c. $x \geq -4$



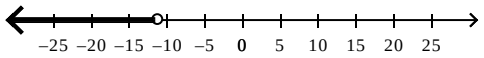

b. $x \leq 0$



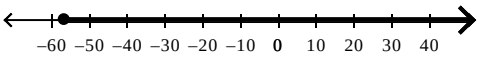

d. $x \leq -4$



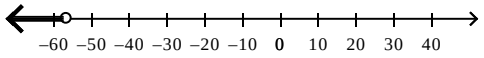

____ 9. $6.7 \geq -0.2x + 4.5$
a. $x < -11$ c. $x \geq -56$

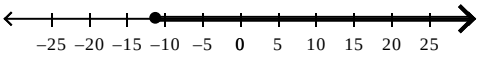



b. $x < -56$




d. $x \geq -11$




____ 10. The width of a rectangle is 13 centimeters. Let $x$ represent the length. Find all possible values for $x$ if the perimeter is at least 228 centimeters.

a. $x \geq 44$ cm b. $x \geq 101$ cm c. $x \geq 18$ cm d. $x \geq 215$ cm

____ 11. Solve the area formula for a triangle, $A = \frac{1}{2}bh$, for $h$.

a. $h = \frac{2b}{A}$ b. $h = \frac{b}{2A}$ c. $h = \frac{2A}{b}$ d. $h = \frac{A}{2b}$

____ 12. You deposit $400 in an account that earns 6% compounded annually (once per year). What is the balance in your account after 5 years? Round your answer to the nearest cent.

a. $535.29 b. $2,120.00 c. $520.00 d. $693.56

____ 13. Alecia deposited $500 in a savings account at 5% compounded semiannually. What is her balance after 6 years?

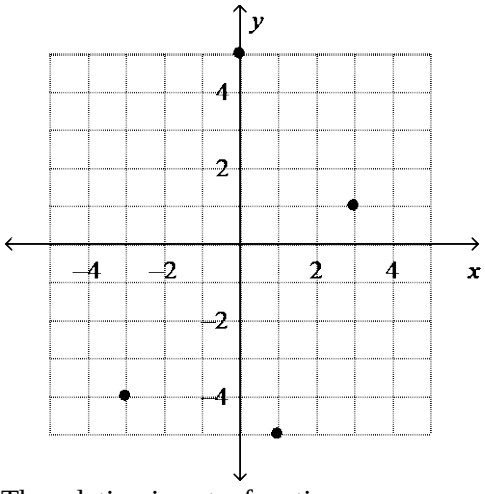
a. $650.00 b. $672.44 c. $670.05 d. $897.93

**Graph the relation in the table. Then use the vertical-line test. Is the relation a function?**

____ 14.

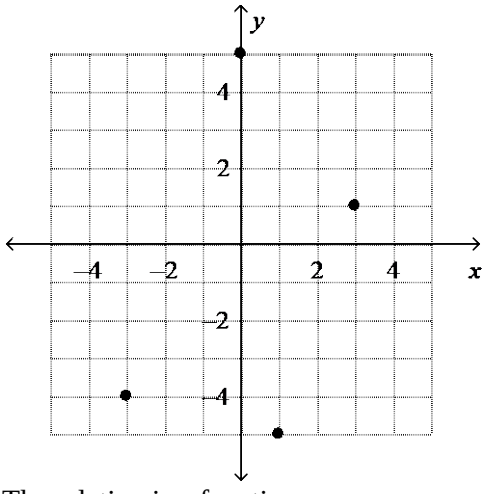
| *x* | *y* |
|---|---|
| –3 | –4 |
| 0 | 5 |
| 1 | –5 |
| 3 | 1 |

a.



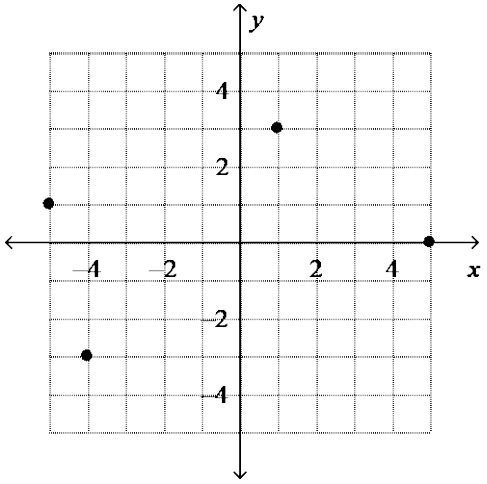

The relation is not a function.

c.



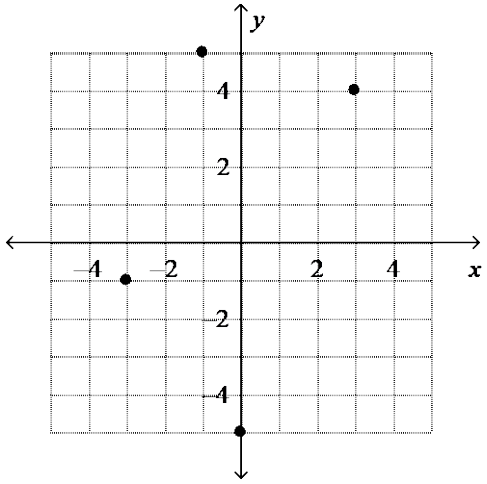

The relation is a function.

b.




The relation is not a function.

d.




The relation is a function.

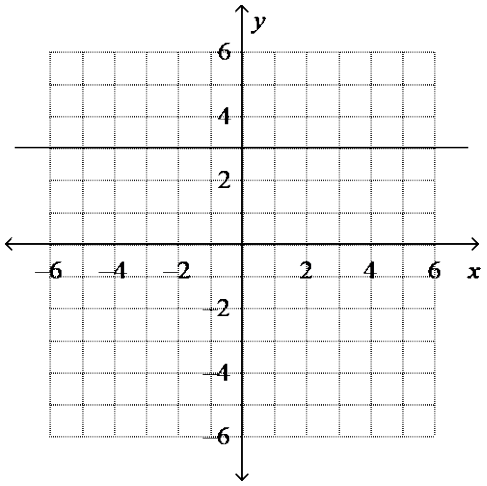
____ 15. The equation $m = 0.3048f$ gives the relationship between $m$ meters and $f$ feet. Express 9 feet in meters. Round your answer to the nearest thousandth.

a. 29.528 meters
b. 3 meters
c. 2.743 meters
d. 9.305 meters

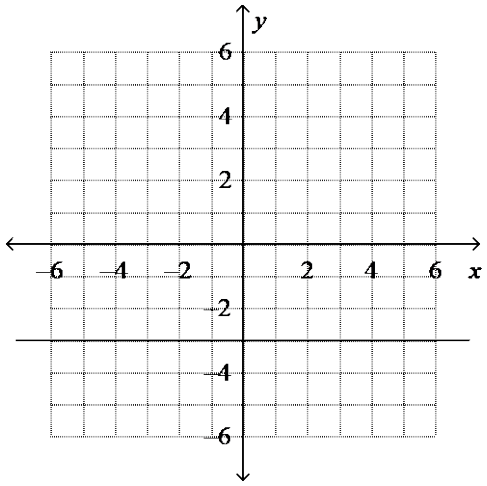
**Graph the linear equation.**

____ 16. $y = –3$

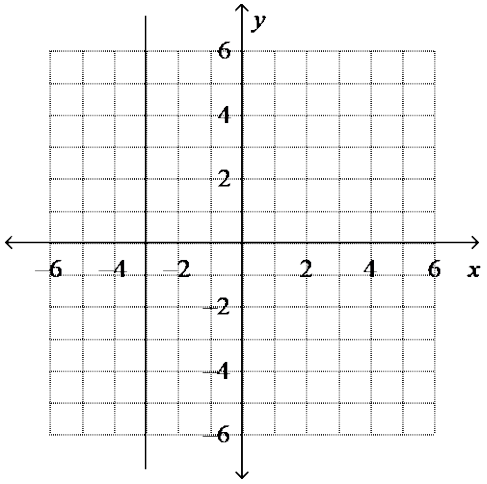
a.



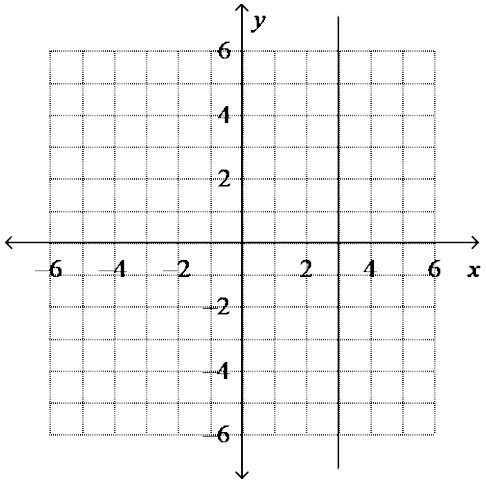

c.



b.

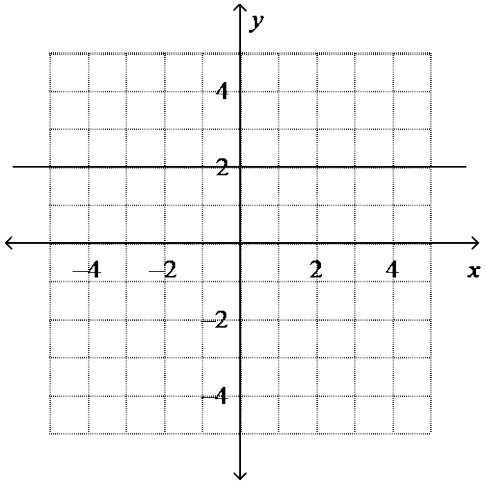



d.

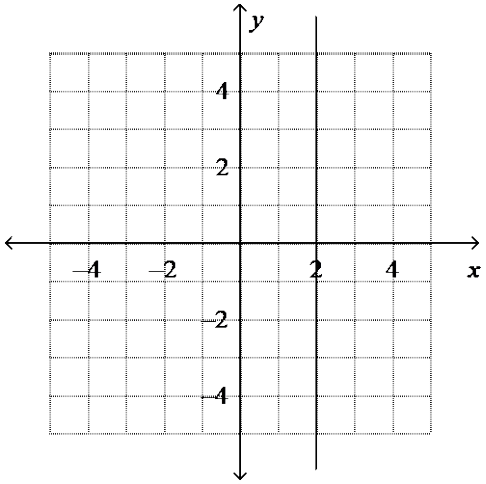



____ 17. $x = 2$

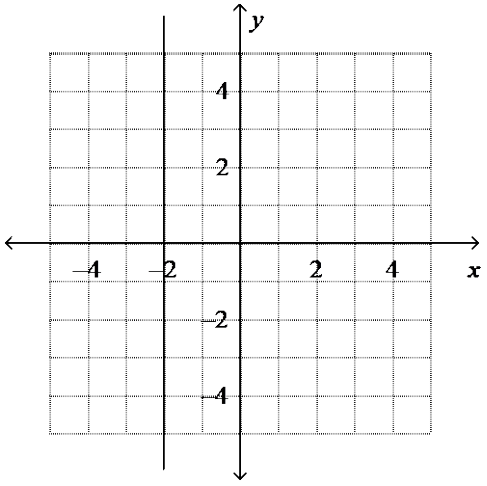
a.



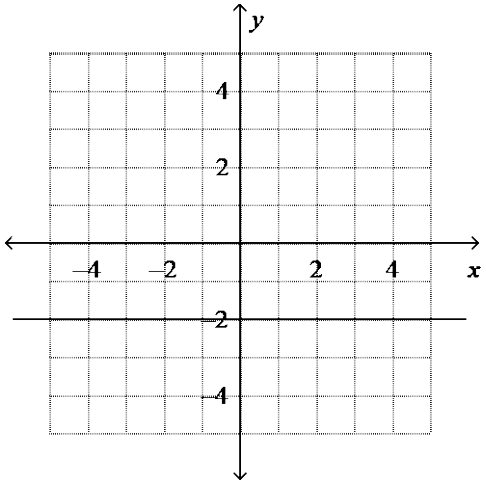

c.




b.




d.




**Write a rule for the linear function in the table.**

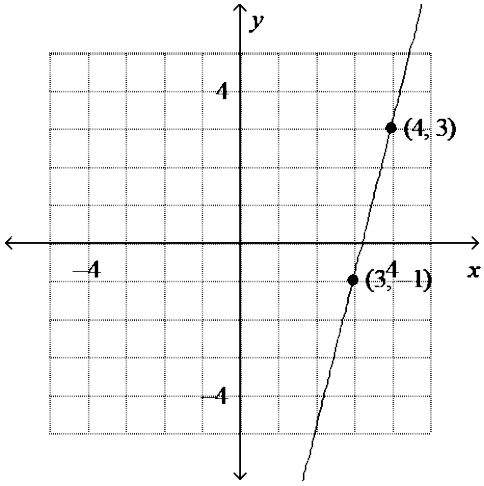
____ 18.

| $x$ | $f(x)$ |
|---|---|
| –3 | –1 |

| | |
|---|---|
| 0 | 2 |
| 3 | 5 |
| 6 | 8 |

a. $f(x) = x + 2$ b. $f(x) = 3x$ c. $f(x) = x - 2$ d. $f(x) = x - 1$

____ 19. Write a rule for the linear function in the graph.

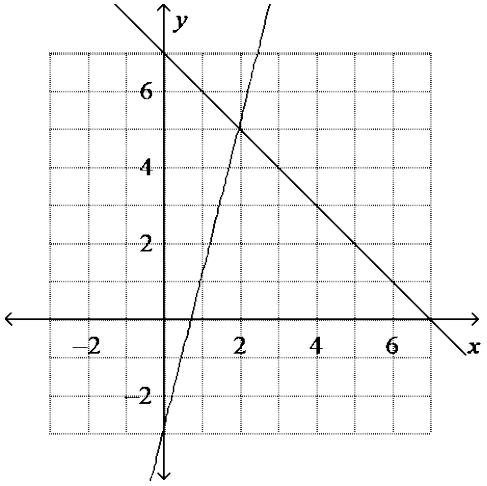



a. $y = -4x + 13$ b. $y = -4x - 13$ c. $y = 4x - 13$ d. $y = \frac{1}{4}x - 13$

**Solve the system of equations by graphing.**

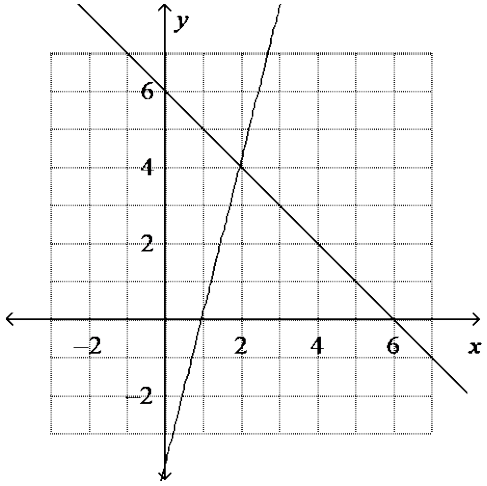
____ 20. $x + y = 7$
$4x - y = 3$

a.



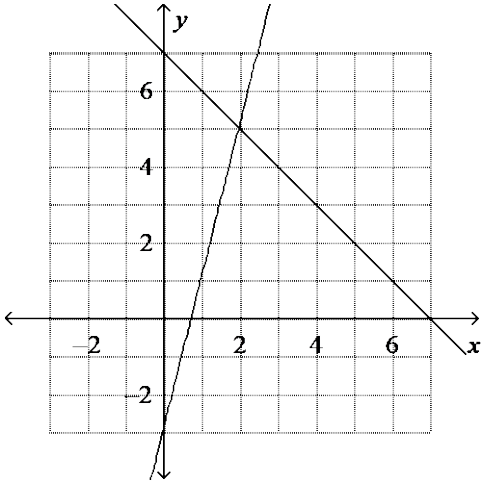

(2, 5)

c.



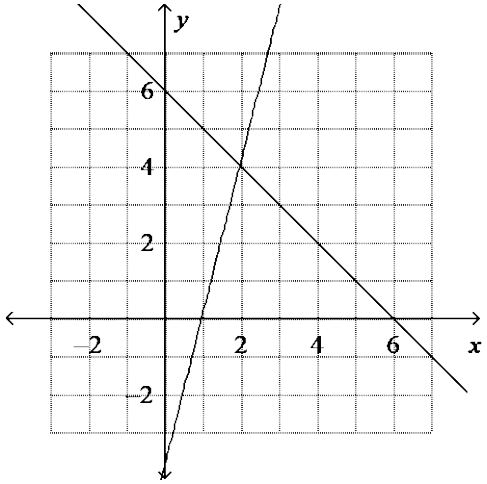

(2, 4)

b.




(5, 2)

d.

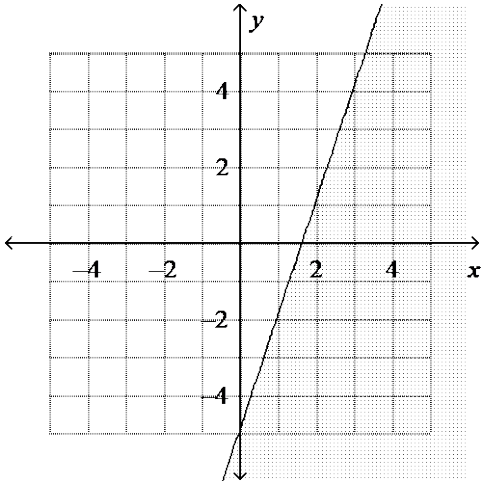



(4, 2)

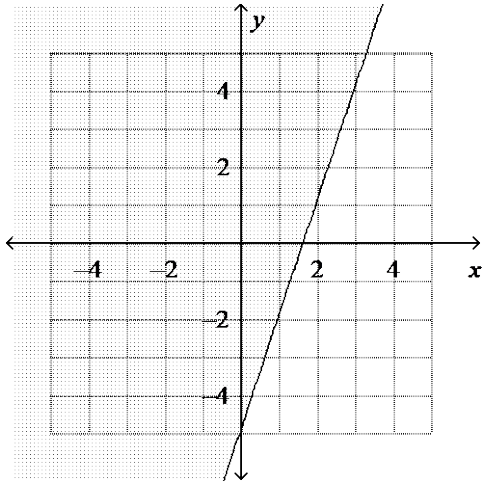
**Graph the inequality on a coordinate plane.**

____ 21. $-y \leq 3x - 5$

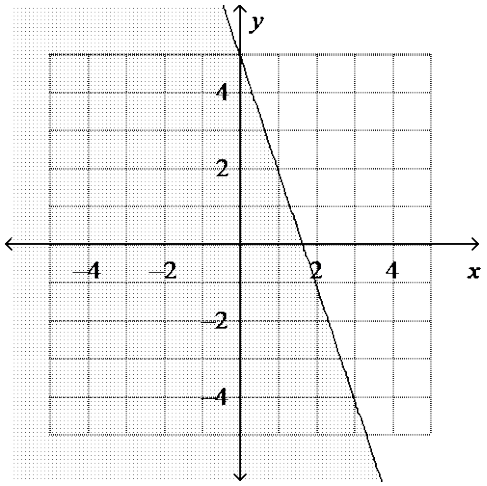
a.



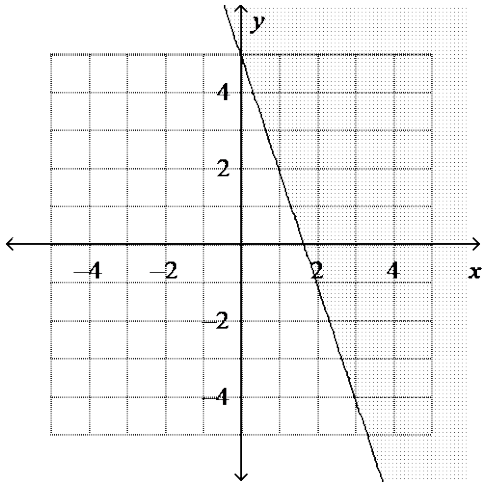

c.




b.

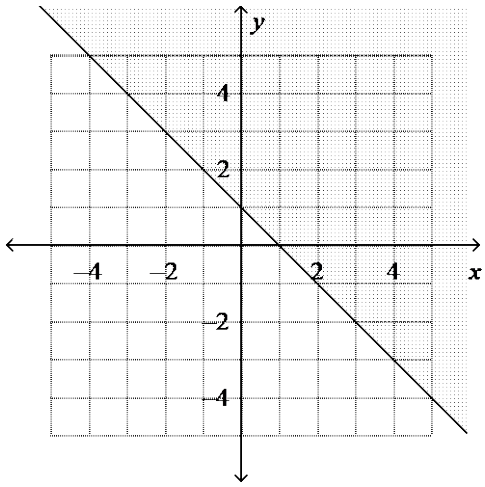



d.



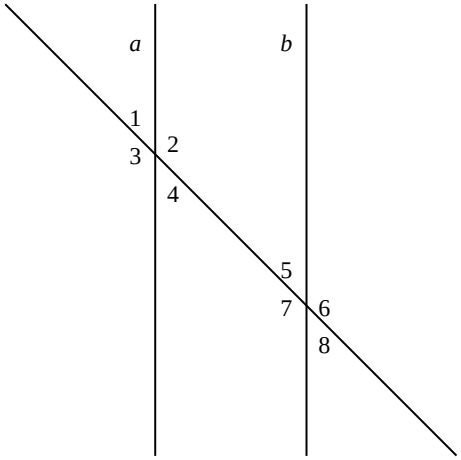

**Write a linear inequality for the graph.**

____ 22.




a. $y \geq -x + 1$
b. $y \leq -x + 1$
c. $y < -x + 1$
d. $y \geq -x$

**In the diagram *a* || *b*. Use the diagram to answer the question. (Diagram not to scale.)**

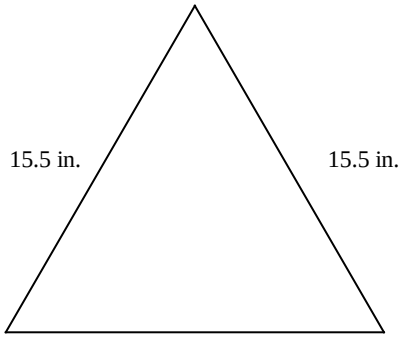



____ 23. Name the corresponding angle to $\angle 5$.
a. $\angle 2$ b. $\angle 4$ c. $\angle 8$ d. $\angle 1$

____ 24. Name the alternate interior angle to $\angle 7$.
a. $\angle 1$ b. $\angle 2$ c. $\angle 6$ d. $\angle 4$

____ 25. If $m\angle 6 = 21°$, what is $m\angle 4$?
a. $21°$ b. $10.5°$ c. $159°$ d. $339°$

____ 26. Classify the triangle by its sides and angles.




not drawn to scale

a. equilateral, acute
b. scalene, right
c. equilateral, right
d. isosceles, acute

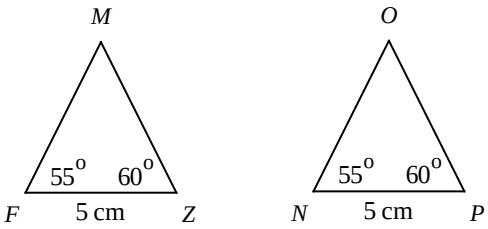
**Name all the quadrilaterals that have the given property.**

____ 27. two pairs of parallel sides and all angles congruent

a. trapezoid
b. rectangle, square
c. rhombus, square
d. rhombus

**Write a congruence statement for the pair of triangles.**

____ 28.




a. $\Delta FZM \cong \Delta NPO$ by ASA
b. $\Delta FZM \cong \Delta NPO$ by SAS
c. $\Delta FZM \cong \Delta PNO$ by SAS
d. $\Delta FZM \cong \Delta PON$ by ASA

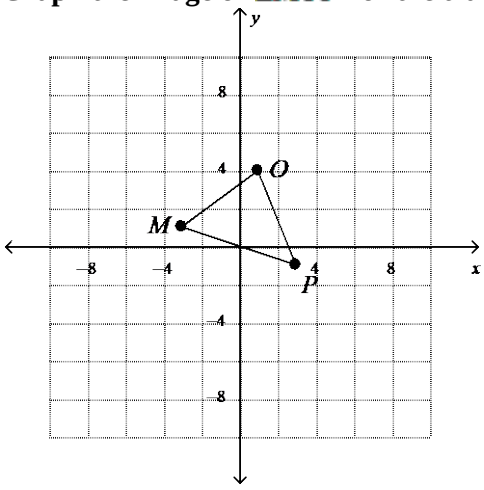
**Students on a field trip at an amusement park were asked their grade in school. The table shows the results of the survey.**

| Grade | Number of Students |
|---|---|
| 4th | 45 |
| 5th | 25 |
| 6th | 60 |
| 7th | 50 |
| 8th | 60 |
| 9th | 45 |

____ 29. Suppose you want to show the data in a circle graph. Find the measure of the central angle for 5th grade. Round your answer to the nearest degree, if necessary.

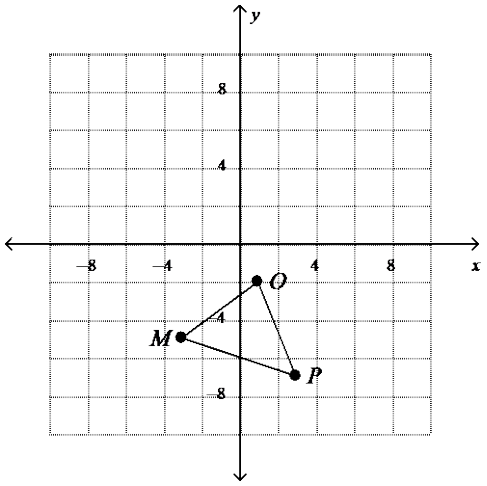
a. $9°$ b. $32°$ c. $16°$ d. $25°$

**Graph the image of $\Delta MOP$ for the translation.**

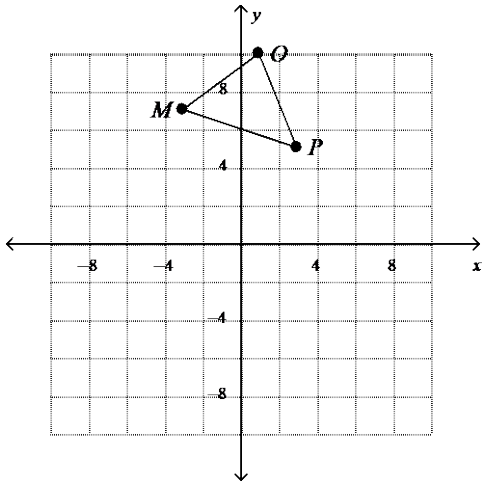



____ 30. 6 units down

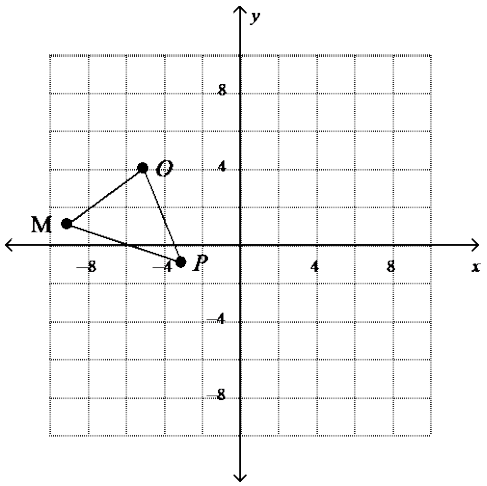
a.



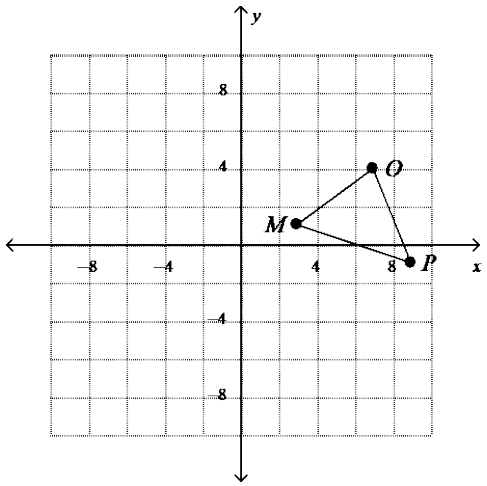

c.



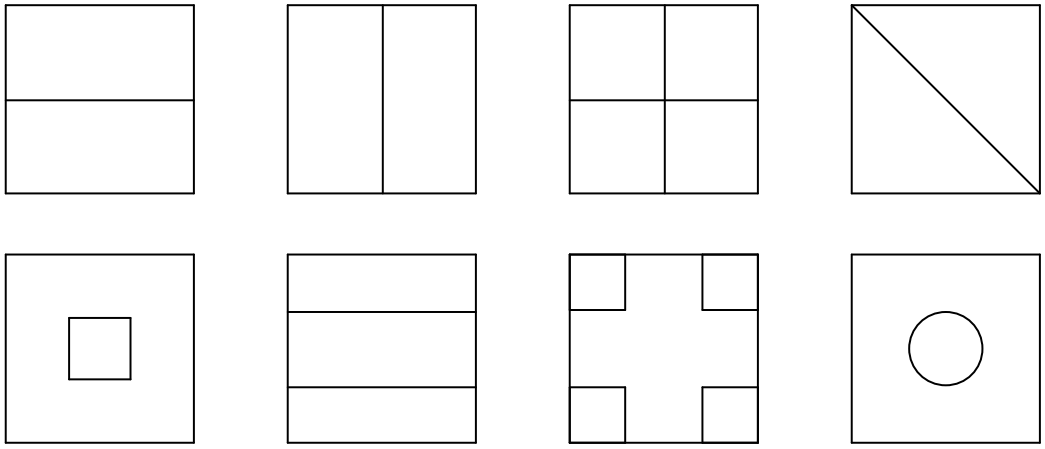

b.




d.



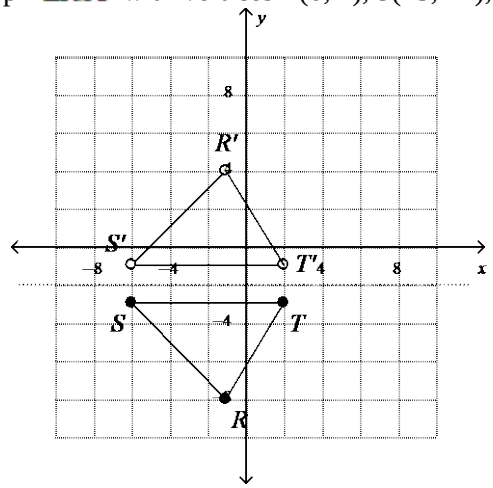
____ 31. Ships at sea can send messages to one another using a code of flags. Diagrams of some of the flags that the United States Navy uses are shown. How many flags have four lines of symmetry?



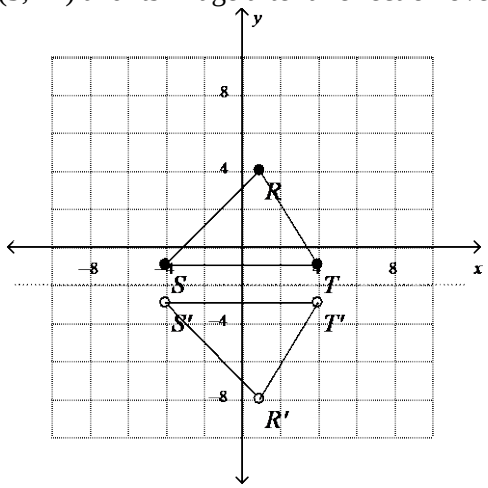
a. 3 flags b. 4 flags c. 5 flags d. 6 flags

____ 32. Graph $\Delta RST$ with vertices $R(0, 4)$, $S(-5, -1)$, and $T(3, -1)$ and its image after a reflection over $y = -2$.

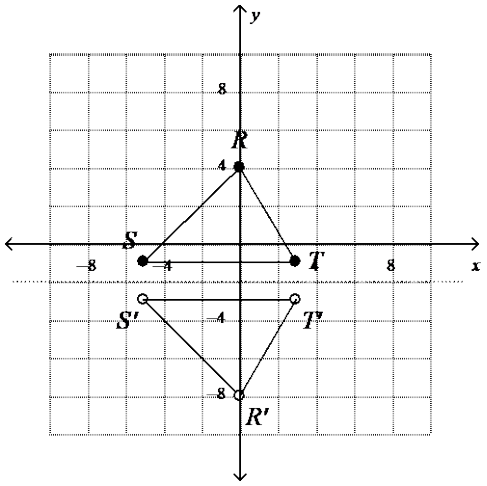
a.



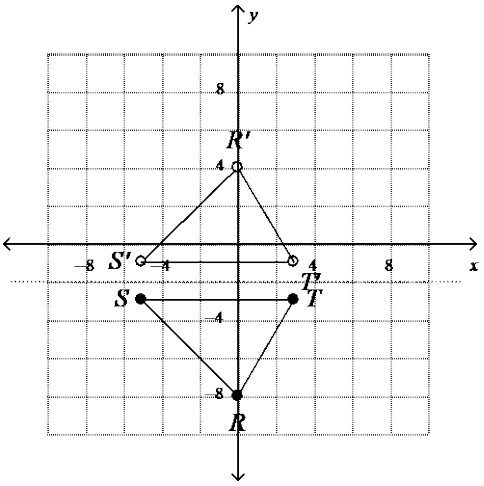

c.




b.



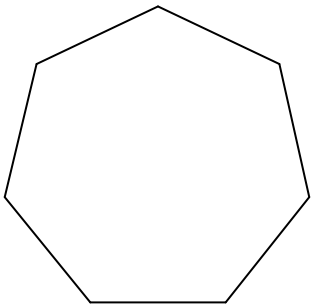

d.



____ 33. Find the coordinates of the image of a triangle with vertices $A(0, -5)$, $B(-9, 0)$, and $C(-6, 2)$ under a rotation of $90°$ clockwise about the origin.

a. $A'(0, -5)$, $B'(9, 0)$, $C'(6, 2)$
c. $A'(0, 5)$, $B'(9, 0)$, $C'(-6, 2)$
b. $A'(5, 0)$, $B'(9, 0)$, $C'(-2, -6)$
d. $A'(-5, 0)$, $B'(0, 9)$, $C'(2, 6)$

____ 34. How many lines of symmetry does the figure have?



a. 7 lines of symmetry
c. 28 lines of symmetry
b. 14 lines of symmetry
d. infinitely many lines of symmetry

**Find the area of the triangle.**

____ 35.

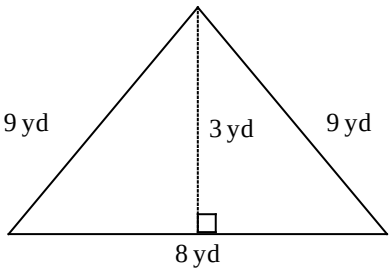



Diagram not to scale.

a. 24 $yd^2$
b. 12 $yd^2$
c. 26 $yd^2$
d. 36 $yd^2$

____ 36. The Pie Factory sells an apple pie with a diameter of 16 inches for $10.99. What is the approximate cost per square inch of surface area of the pie? Use 3.14 for $\pi$.

a. $.67
b. $.83
c. $.01
d. $.05

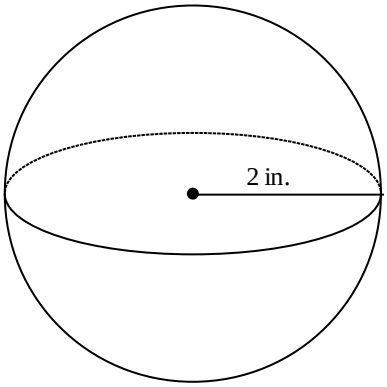
**Write the most precise name for the space figure with the given properties.**

____ 37. a lateral surface and two circular bases

a. prism
b. sphere
c. cone
d. cylinder

**Find the surface area of the sphere to the nearest square unit. Use a calculator.**

____ 38.

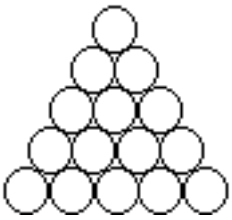



a. 50 $in.^2$ b. 13 $in.^2$ c. 201 $in.^2$ d. 25 $in.^2$

____ 39. You are designing a new container for powdered laundry detergent. You are considering a cylindrical container with a diameter of 14 inches and a height of 18 inches. Find the volume of this container to the nearest cubic unit.Use a calculator.

a. 1,100 $in.^3$ b. 882 $in.^3$ c. 11,084 $in.^3$ d. 2,771 $in.^3$

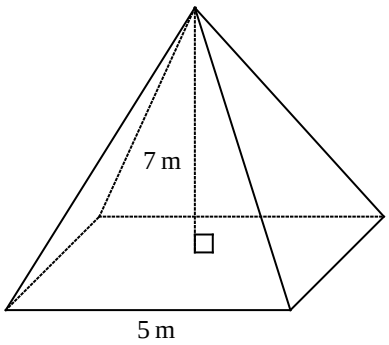
____ 40. A grocery clerk sets up a display of oranges in the form of a triangle using 10 oranges at the base and 1 at the top (Only part of the display is shown.). How many oranges are there in the display?



a. 130 oranges b. 105 oranges c. 120 oranges d. 136 oranges

**Find the volume of the square pyramid to the nearest cubic unit.**

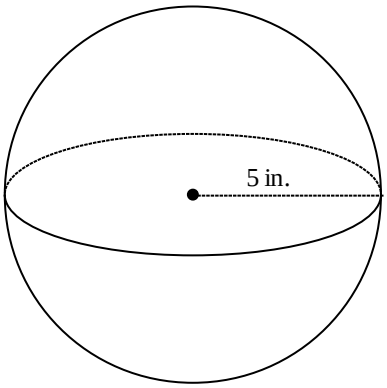
____ 41.




a. 175 $m^3$ b. 233 $m^3$ c. 58 $m^3$ d. 88 $m^3$

**Find the volume of the sphere to the nearest whole number. Use $\pi = 3.14$.**

____ 42.



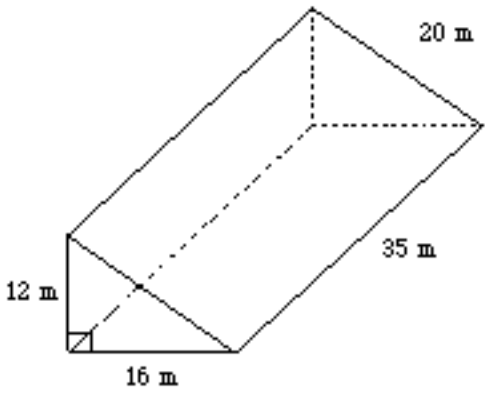

a. 524 in.$^3$ b. 131 in.$^3$ c. 4,189 in.$^3$ d. 393 in.$^3$

____ 43. $d$ = 4 cm

a. 33 cm$^3$ b. 268 cm$^3$ c. 50 cm$^3$ d. 201 cm$^3$

**Find the surface area of the prism.**

____ 44.



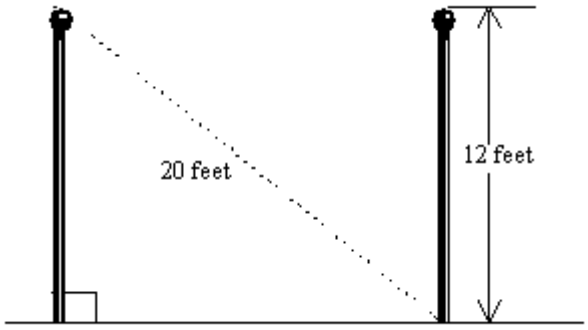

a. 6,720 m$^2$ b. 1,662 m$^2$ c. 1,872 m$^2$ d. 3,360 m$^2$

**Estimate the square root to the nearest integer.**

____ 45. $-\sqrt{11}$

a. –4 b. –5 c. –2 d. –3

____ 46. Two flag poles in front of the Court House are 12 ft tall. The distance from the top of one pole to the base of the other as shown in the diagram is 20 ft. What is the distance between the two flag poles?



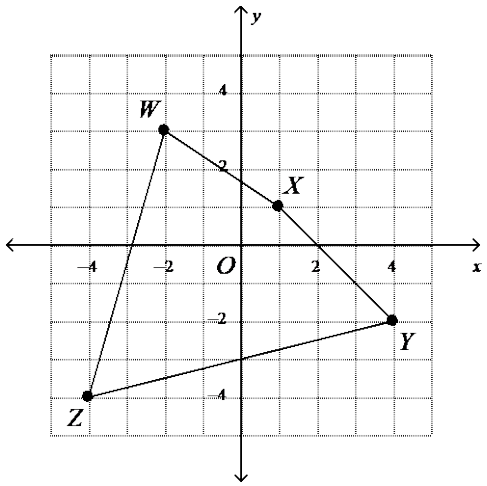

a. 16 ft b. 23 ft c. 18 ft d. 15 ft

**The lengths of two sides of a right triangle are given. Find the length of the third side. Round to the nearest tenth if necessary.**

____ 47. leg: 20 m; hypotenuse: 25 m

a. 10.5 m b. 8.9 m c. 32 m d. 15 m

____ 48. Find the perimeter of *WXYZ*. Round to the nearest tenth if necessary.



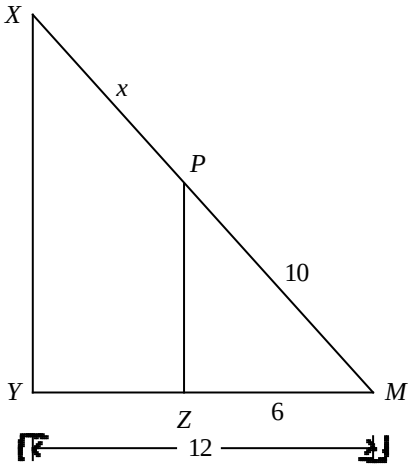

a. 3.2 b. 23.4 c. 152 d. 21.3

____ 49. $M(-3, -1)$ is the midpoint of $\overline{RS}$. If $S$ has coordinates (4, 6), what are the coordinates of $R$?

a. (–10, –8) b. (–10, 13) c. (11, 13) d. (11, –8)

**Write a proportion and find the value of *x* in the diagram. Round to the nearest tenth if necessary.**

____ 50. $\Delta XYM \sim \Delta PZM$




Not drawn to scale

a. $\frac{10}{x+10} = \frac{6}{12}$; 10

b. $\frac{x}{10} = \frac{6}{12}$; 18.3

c. $\frac{x}{10} = \frac{6}{12}$; 5

d. $\frac{10}{x+10} = \frac{6}{12}$; 18.3

____ 51. In a 30°-60°-90° triangle, the length of the side opposite the 30° angle is 9 mm. Find the length of the side opposite the 60° angle and the length of the hypotenuse.

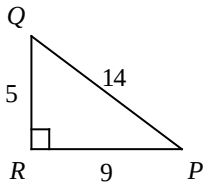
a. $9\sqrt{3}$ mm, $9\sqrt{3}$ mm

b. 9 mm, 18 mm

c. $9\sqrt{3}$ mm, $18\sqrt{3}$ mm

d. $9\sqrt{3}$ mm, 18 mm

____ 52. For $\Delta QPS$, find the sine, cosine, and tangent of $\angle P$.




Not drawn to scale

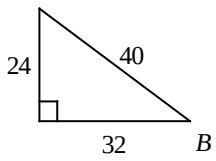
a. $\sin P = \frac{9}{14}$, $\cos P = \frac{5}{14}$, $\tan P = \frac{5}{9}$

b. $\sin P = \frac{5}{14}$, $\cos P = \frac{9}{14}$, $\tan P = \frac{9}{5}$

c. $\sin P = \frac{5}{14}$, $\cos P = \frac{9}{14}$, $\tan P = \frac{5}{9}$

d. $\sin P = \frac{14}{5}$, $\cos P = \frac{14}{9}$, $\tan P = \frac{5}{9}$

____ 53. Use the diagram to find $\cos B$ as a fraction in simplest form.




a. $\frac{4}{5}$

b. $\frac{3}{5}$

c. $\frac{3}{4}$

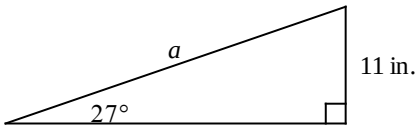
d. $\frac{4}{3}$

**Use a calculator to find the given value. Round to four decimal places.**

____ 54. tan 27°

a. 0.8910 b. 1.9626 c. 0.4540 d. 0.5095

____ 55. Find the value of *a* in the diagram of the right triangle. Round to the nearest tenth.



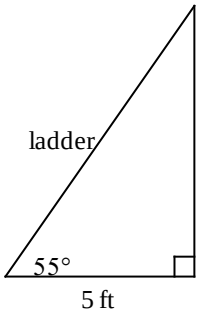

Not drawn to scale

a. 21.6 in. b. 24.2 in. c. 5.0 in. d. 12.3 in.

____ 56. A slide 4.8 m long makes an angle of 28° with the ground. How high above the ground is the top of the slide?

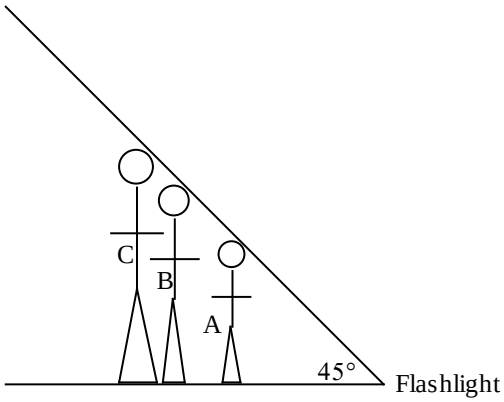
a. 2.3 m b. 4.2 m c. 2.6 m d. 1.5 m

____ 57. A ladder leans against a building forming an angle of 55° with the ground as shown in the diagram. The base of the ladder is 5 feet from the building. What is the length of the ladder?




a. 9.1 feet b. 6.1 feet c. 7.1 feet d. 8.7 feet

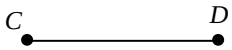
____ 58. The figure below shows a flashlight beam shining on the heads of three people such that it hits exactly at the top of each head. The angle of elevation from the ground to the top of each of the three heads is 45°. Person A is 4 feet tall, Person B is 5.5 feet tall, and Person C is 6.5 feet tall. How far away from the flashlight is each person?




a. 4 feet, 5 feet, 6 feet
b. 4.5 feet, 5.5 feet, 6.5 feet
c. 4 feet, 5.5 feet, 6.5 feet
d. 6.9 feet, 9.5 feet, 11.3 feet

**Short Answer**

59. Construct a segment congruent to $\overline{CD}$.




60. Michelle wants to make a packing box from some cardboard she has. She wants the box to be a rectangular prism. Draw a possible net for the packing box.