

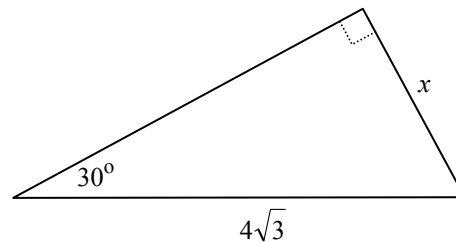
Sandia High School
Geometry—Second Semester
FINAL EXAM

Name: _____

Mark the letter to the *single*, correct (or most accurate) answer to each problem.

1. What is the value of x in the triangle on the right?

- A. 12 B. 6 C. $2\sqrt{3}$
D. 4 E. 8



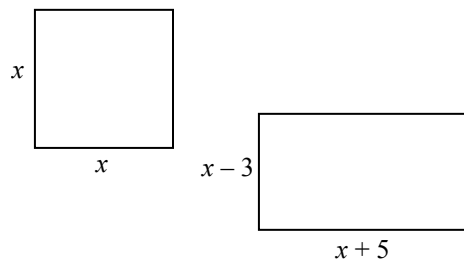
2. What is the distance between the points $(3, -5)$ and $(-2, 7)$?

- A. 17 B. 14 C. 12 D. 13 E. 15

3. Which of the following is NOT true of a 30-60-90 triangle?

- A. One angle is twice as large as another angle.
B. One leg is twice as large as the other leg.
C. The smallest angle is three times as large as the biggest angle.
D. The ratio of the longer leg to the hypotenuse is $\frac{\sqrt{3}}{2}$.
E. The side opposite the 30° angle is half as long as the hypotenuse.

4. A square and a rectangle have the same area. The width of the rectangle is 3 cm less than the width of the square, and the length of the rectangle is 5 cm more than the length of the square. How long is each side of the square?



- A. 6 cm B. 7 cm C. 6.5 cm D. 7.5 cm E. 8.5 cm

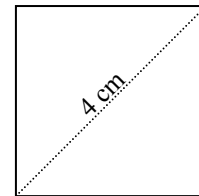
5. A thin wire 36 inches long is bent to form a rectangle. If the width of that rectangle is 8 inches, then what is its area?

A. 81 in^2 B. 80 in^2 C. 180 in^2 D. 160 in^2 E. 72 in^2

6. What is the area of a square in which each diagonal measures 4 cm?

A. 8 cm^2 B. 16 cm^2 C. 32 cm^2

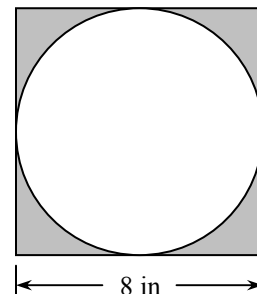
D. $8\sqrt{2} \text{ cm}^2$ E. $16\sqrt{2} \text{ cm}^2$



7. What is the ratio of the area of the shaded region to the area of the square?

A. 0.785 B. 0.607 C. 0.215

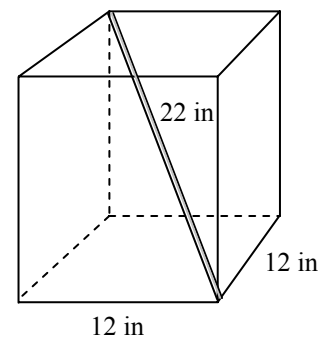
D. 0.393 E. 0.5



8. A box has a square base measuring 12 inches on a side. A thin rod that is 22 inches long will just barely fit in this box. How tall is the box?

A. 24 in B. 12 in C. 16 in

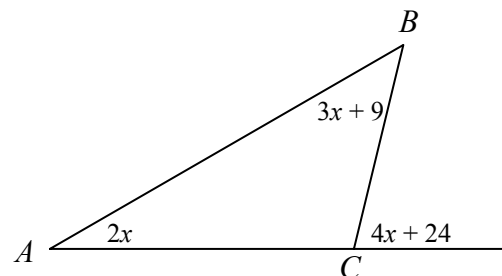
D. 15 in E. 14 in



9. What is the measure of angle ACB ?

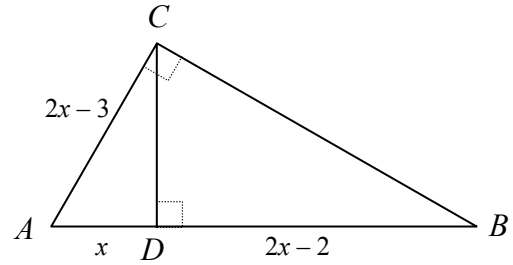
A. 96° B. 86° C. 84°

D. 86° E. 94°



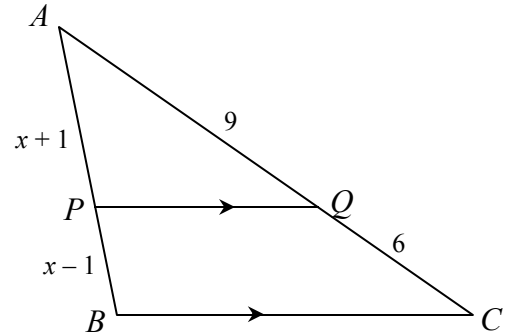
10. Find AB :

- A. 22 B. 24 C. 18
 D. 32 E. 25



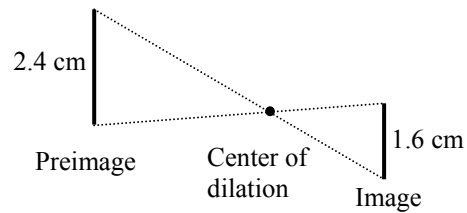
11. If segment PQ is parallel to segment BC , find the length of segment AB :

- A. 12 B. 14 C. 10
 D. 15 E. 9



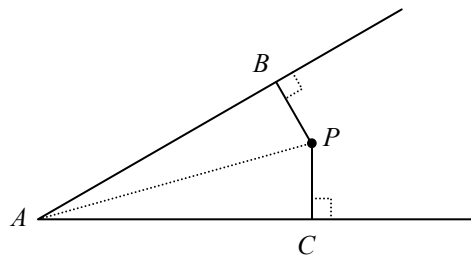
12. The figure on the right shows a segment and its image under a dilation. What is the scale factor of the dilation?

- A. $\frac{3}{5}$ B. $-\frac{3}{4}$ C. $\frac{5}{3}$ D. $-\frac{5}{3}$ E. $-\frac{2}{3}$



13. Suppose $BP = CP$, $PB \perp AB$, and $PC \perp AC$. Then which of the following might NOT be true?

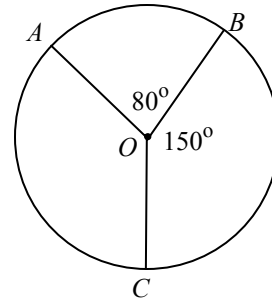
- A. P is on the bisector of $\angle A$
 B. $AP = AB$
 C. $\angle A$ and $\angle P$ are supplementary
 D. The midpoint of AP is the center of a circle that contains A , B , P , and C .
 E. $AB = AC$



Problems 14-15: Refer to the circle at the right.

14. Find the degree measure of \widehat{AC} .

- A. 50° B. 140° C. 130°
 D. 120° E. 110°

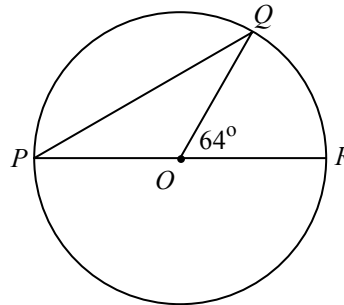


15. If the circumference of $\odot O$ is 48 cm, then what is the length of \widehat{BC} ?

- A. 20 cm B. 24 cm C. 64 cm D. 48 cm E. 52 cm

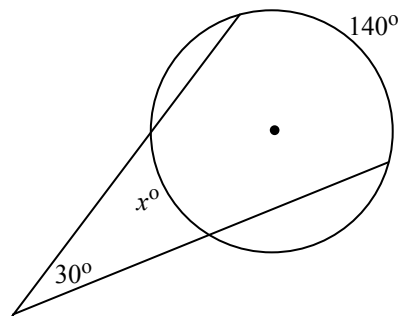
16. What is the degree measure of $\angle P$?

- A. 64° B. 32° C. 128°
 D. 43° E. 30°



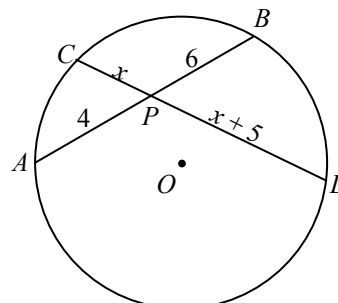
17. What is the value of x ?

- A. 55° B. 110° C. 60°
 D. 40° E. 30°



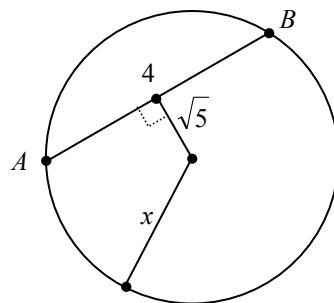
18. Find the value of x , if $AP = 4$, $BP = 6$, $CP = x$, and $DP = x + 5$.

- A. 3 B. 8 C. 5
 D. 2 E. 4



19. If $AB = 4$, what is the value of x ?

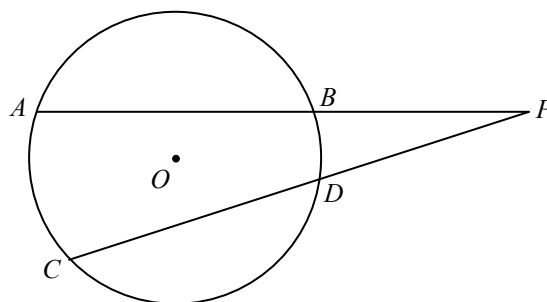
- A. 2 B. $\sqrt{21}$ C. $\sqrt{11}$
 D. 3 E. 4



20. Given: $AB = 16$, $BP = 14$, $CP = 25$

Find: CD

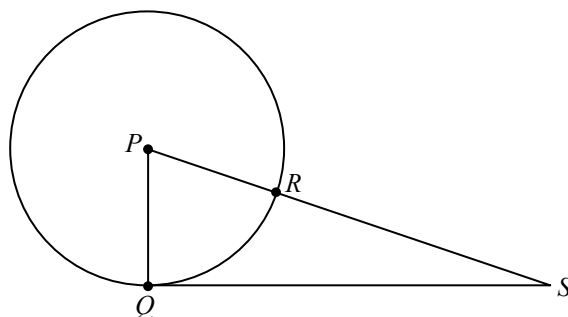
- A. 10 B. 6.8 C. 8.2
 D. 9 E. 12



21. Given: $\odot P$ with radius 10 cm, $RS = 16$ cm,
 \overline{QS} is tangent to $\odot P$ at Q

Find: QS

- A. 20 cm B. 22 cm C. 30 cm
 D. 21 cm E. 24 cm



22. If you reflect a geometric figure in two intersecting lines that make an angle of 20° with each other, then the result is the same as:

- A. a rotation through 20° B. a rotation through 40°
 C. a rotation through 10° D. a rotation through 90°

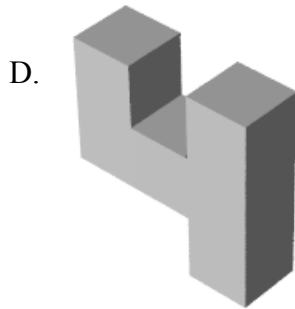
23. What is the locus of points that are equidistant from the three sides of a triangle?

- A. The center of its inscribed circle B. The center of its circumscribed circle
 C. Its centroid D. Its orthocenter E. Its excenter

24. Which of the following objects has the top view shown here?

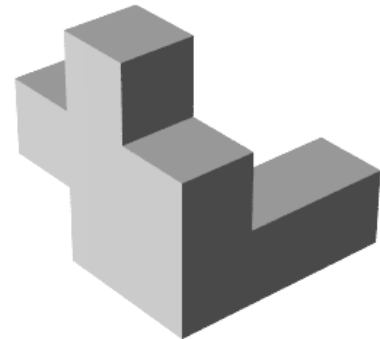


Top view



25. The solid object on the right is made of 8 cubes glued together. Each of these cubes measures one cubic inch. What is the volume of that object?

- A. 24 in^3 B. 64 in^3 C. 16 in^3
 D. 8 in^3 E. 32 in^3



26. What is the volume of a cube which has a surface area of 384 in^2 ?

- A. 1024 in^3 B. 768 in^3 C. 256 in^3 D. 512 in^3 E. 1152 in^3

27. How many cubic inches are in a cubic foot?

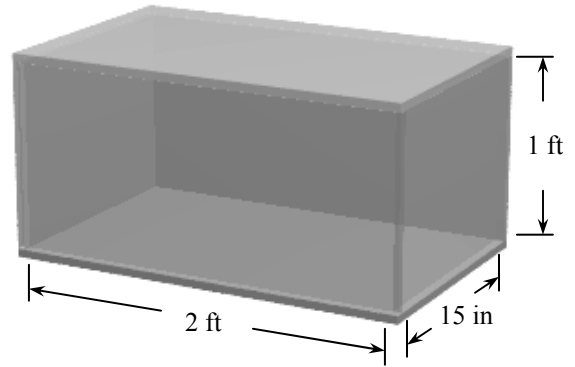
- A. 864 B. 48 C. 144 D. 1728 E. 12

28. The volume of the cube pictured on the right is 125 in^3 . What is the volume a cube whose edges are twice as long as the edges of this cube?



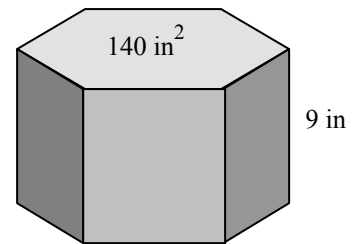
- A. 375 in^3 B. 250 in^3 C. 625 in^3 D. 1200 in^3 E. 1000 in^3

29. A crate (right rectangular prism) is made from $\frac{1}{2}$ inch thick plywood. The inside dimensions are 2 ft by 15 in by 1 ft. What is the capacity (volume of the inside) of that crate?



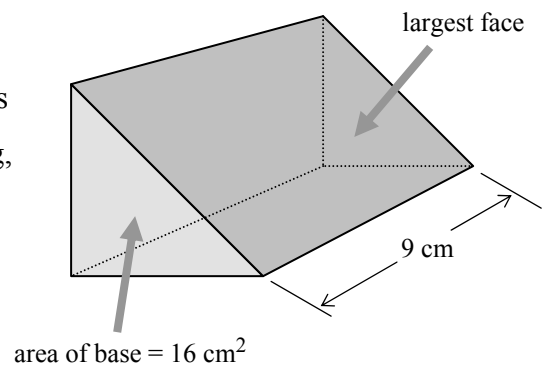
- A. 4320 in^3 B. 30 in^3 C. 1080 in^3
D. 3500 in^3 E. 2160 in^3

30. The altitude of a regular, right hexagonal prism is 9 inches, and the area of each base is 140 square inches. What is the volume of this prism?



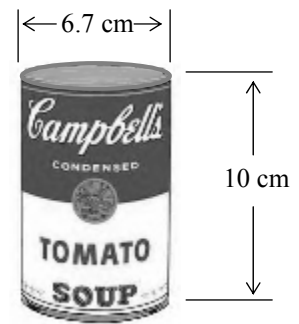
- A. 420 in^3 B. 1260 in^3 C. 630 in^3
D. 840 in^3 E. 1520 in^3

- Problems 31-32:** The bases of a right prism are isosceles right triangles. The prism is 9 cm long, and the area of each base is 16 cm^2 .



31. What is the volume of that prism?
- A. 72 cm^3 B. 96 cm^3 C. 144 cm^3 D. 288 cm^3 E. 108 cm^3
32. What is area of the largest face of that prism?
- A. 36 cm^2 B. 24 cm^2 C. 48 cm^2 D. 72 cm^2 E. 144 cm^2

Problems 33-34: A soup can has a diameter of 6.7 cm and is 10 cm tall.



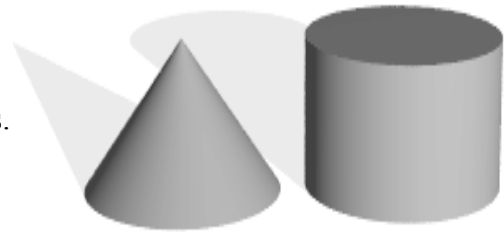
33. The label is printed on a rectangular sheet of paper that is 10 cm wide and how long?

- A. 21.05 cm B. 10.52 cm C. 13.4 cm
D. 35.26 cm E. 17.63 cm

34. What is the volume of soup the can will hold?

- A. 210.49 cm^3 B. 105.24 cm^3 C. 318.74 cm^3 D. 420.98 cm^3 E. 352.57 cm^3

Problems 35-36: A right, circular cone and a right, circular cylinder have congruent bases.



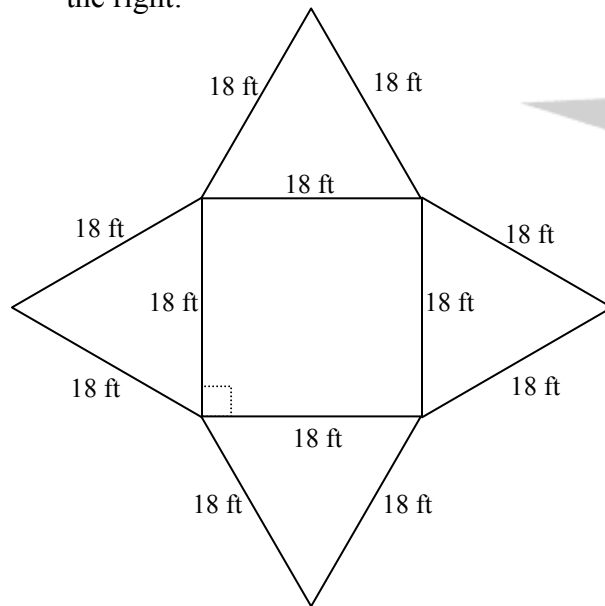
35. If the slant height of the cone is the same as the height of the cylinder, what is the ratio of the cone's lateral surface area to the cylinder's lateral surface area?

- A. $\frac{1}{2}$ B. $\frac{1}{4}$ C. $\frac{1}{3}$ D. $\frac{1}{1}$ E. $\frac{2}{1}$

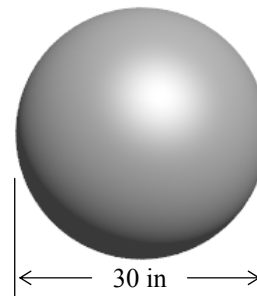
36. If the cone and the cylinder have the same heights, what is the ratio of the cone's volume to the cylinder's volume?

- A. $\frac{1}{2}$ B. $\frac{1}{4}$ C. $\frac{1}{3}$ D. $\frac{1}{1}$ E. $\frac{2}{1}$

Problems 37-40: Below is a net for the right rectangular pyramid with a square base pictured on the right:

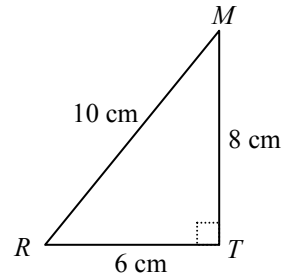


37. What is the slant height of this pyramid?
 A. 9 ft B. 12 ft C. 18 ft D. $9\sqrt{2}$ ft E. $9\sqrt{3}$ ft
38. What is the total surface area of this pyramid?
 A. 648.0 ft^2 B. 885.2 ft^2 C. 1446 ft^2 D. 723.2 ft^2 E. 604.6 ft^2
39. What is the altitude of this pyramid?
 A. 9 ft B. 12 ft C. $9\sqrt{3}$ ft D. $9\sqrt{2}$ ft E. $18\sqrt{3}$ ft
40. What is the volume of this pyramid?
 A. 1374.6 ft^3 B. 1286.4 ft^3 C. 1236.4 ft^3 D. 1403.2 ft^3 E. 1302.6 ft^3
41. A beach ball has a diameter of 30 inches. What is its volume?
 A. $28,274.5 \text{ in}^3$ B. 2120.6 in^3 C. 942.5 in^3
 D. $14,137.2 \text{ in}^3$ E. 188.5 in^3



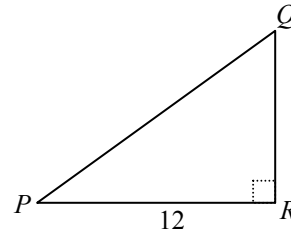
42. Which of the following is true for the triangle on the right?

- A. $\sin \angle R = \frac{3}{5}$ B. $\sin \frac{3}{5} = m\angle R$
 C. $\cos \angle R = \frac{3}{5}$ D. $\cos \frac{3}{5} = \frac{6}{10}$
 E. $\tan \frac{8}{6} = m\angle R$



43. If $\tan P = \frac{2}{3}$, then how long is \overline{QR} ?

- A. 23.66 B. 4.226 C. 33.69
 D. 9 E. 8

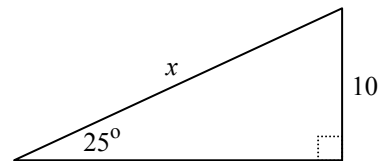


44. If one leg of a right triangle is three times as long as the other leg, then what is the measure of the smallest angle in this triangle?

- A. 16.7° B. 18.4° C. 23.1° D. 30° E. 27.2°

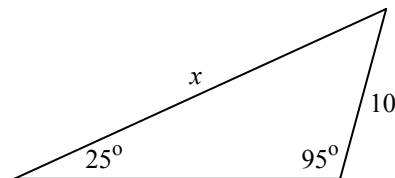
45. Find x in the following right triangle:

- A. 23.66 B. 4.226 C. 9.063
 D. 21.42 E. 23.57



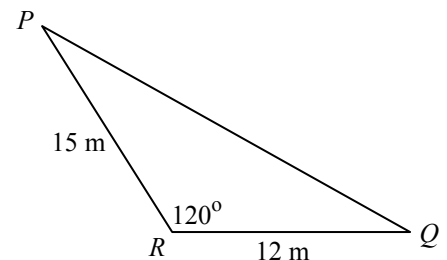
46. Find x in this triangle:

- A. 23.66 B. 9.063 C. 14.62
 D. 21.42 E. 23.57



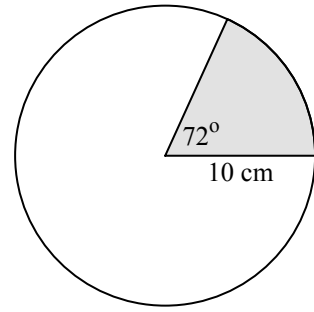
47. What is the length of side \overline{PQ} in the triangle on the right?

- A. 21.4 m B. 23.4 m C. 19.2 m
 D. 27.0 m E. 18.7 m



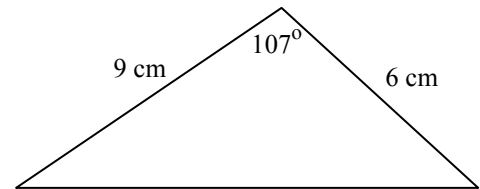
48. What is the area of a sector of 72° in a circle with radius 10 cm?

- A. $50\pi \text{ cm}^2$
 $36\pi \text{ cm}^2$
- B. $20\pi \text{ cm}^2$
- C.
- D. $40\pi \text{ cm}^2$
- E. $\frac{25\pi}{2} \text{ cm}^2$



49. The area of the triangle on the right is:

- A. 25.82 cm^2
- B. 4.99 cm^2
- C. 27.00 cm^2
- D. 23.60 cm^2
- E. 10.98 cm^2



50. What is the area of the triangle whose sides measure 13 cm, 14 cm and 15 cm?

- A. 84 cm^2
- B. 84 cm^2
- C. 92 cm^2
- D. 108 cm^2
- E. 112 cm^2

