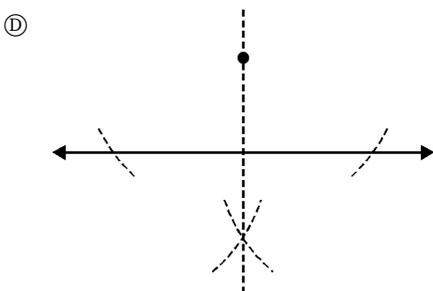
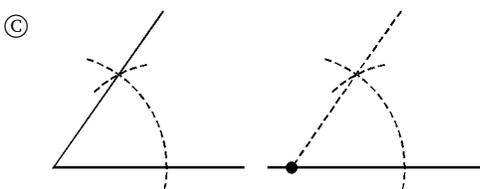
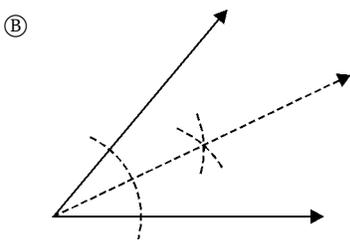
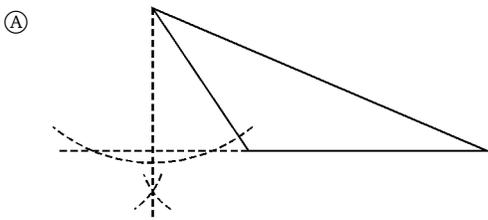


1. Which of the following figures shows the construction of an angle bisector?



2. Given $A(-2, 4)$, $B(6, 2)$, $C(8, 6)$ and $D(0, 8)$.
- Find the midpoints of quadrilateral $ABCD$. Call them E , F , G , and H respectively.
 - Find the lengths of \overline{EF} and \overline{GH} .
 - Find the lengths of \overline{FG} and \overline{EH} .
 - What kind of quadrilateral is $EFGH$?

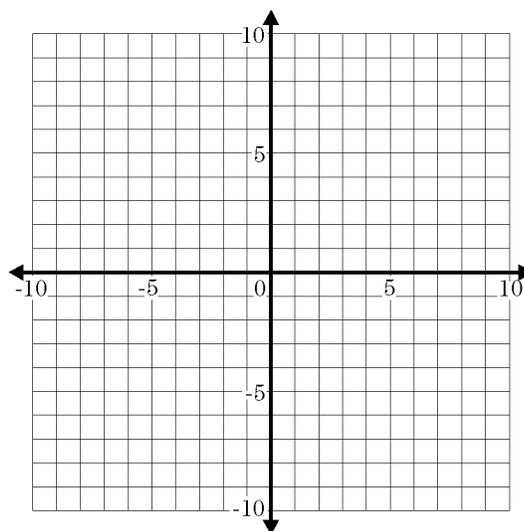
3. Which of these symbols have point symmetry?



- (A) I only (B) IV only
 (C) I and II only (D) all except II

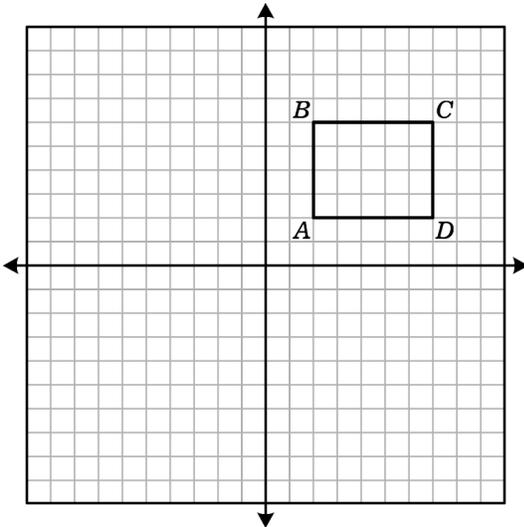
4. Given the points $C(0, 0)$, $A(0, 8)$ and $T(6, 0)$:

a) Graph $\triangle CAT$.



- Rotate $\triangle CAT$ 90° counterclockwise about the origin. Graph the new triangle on the coordinate system above. Label the new vertices.
- Find the area of the new triangle. How do the two areas compare?

5.



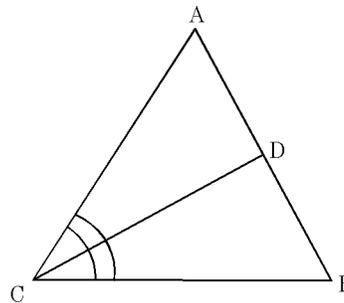
Using the coordinate plane, which of the following statements would result in figure $ABCD$ being in Quadrant IV?

- I. Figure $ABCD$ is reflected across the x -axis.
- II. Figure $ABCD$ is reflected across the y -axis.
- III. Figure $ABCD$ is translated 4 units to the left and 2 units down.
- IV. Figure $ABCD$ is rotated 90° about point B .

- Ⓐ I only
- Ⓑ II only
- Ⓒ III only
- Ⓓ IV only

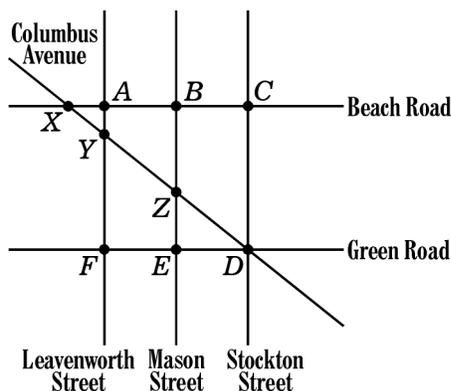
6. Given the diagram as marked $\triangle ABC$ is scalene and \overline{CD} is an angle bisector. To prove that \overline{CD} cannot be perpendicular to \overline{AB} the steps are given but not necessarily in the correct order, and one step is missing. Find the missing step.

- I. Therefore $m\angle A = m\angle B$ and $\triangle ABC$ is isosceles.
- II. $\triangle CDA \cong \triangle CDB$ by ASA.
- III. $CD = CD$.
- IV. Therefore assumption is false and CD is not perpendicular to AB .
- V. $m\angle ACD = m\angle BCD$



- Ⓐ Assume $m\angle CDA = m\angle CDB = 90$.
- Ⓑ $m\angle A = m\angle B$.
- Ⓒ Assume $CA = CB$.
- Ⓓ There is no missing step.

11. A partial map San Francisco's North Beach neighborhood is shown below. The distance between streets is 440 yds and between roads is 580 yds. The measure of $\angle ZDC$, where Stockton Street and Columbus Avenue intersect, is 62° . The length of \overline{ZE} , the distance on Mason Street between Green Road and Columbus Avenue, is 235 yds.



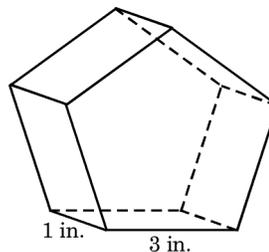
- What is the measure of $\angle FYX$, the intersection of Leavenworth Street and Columbus Avenue?
- Name two triangles that are similar to $\triangle XAY$.
- What is the length of \overline{XB} , the distance on Beach Road between Columbus Avenue and Mason Street? Round to the nearest integer and show all your work.

12. The angle θ is in the first quadrant and $\sin \theta = \frac{2}{\sqrt{13}}$.

Determine possible coordinates for point P on the terminal arm of θ .

- (A) $(\sqrt{13}, 2)$ (B) $(2, 3)$
 (C) $(3, 2)$ (D) $(3, \sqrt{13})$

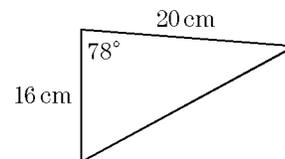
13. You are trying to buy a neutral present for your neighbor's birthday so you decide on a box of candy. The box is in the shape of a pentagonal prism. What is the volume of the box?



- (A) 18 in^3 (B) 309 in^3
 (C) 30.9 in^3 (D) 15.45 in^3

14. To the nearest tenth of a square centimeter, what is the area of the triangle shown?

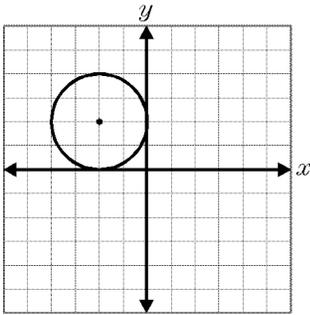
- (A) 107.9
 (B) 135.9
 (C) 156.5
 (D) 196.9



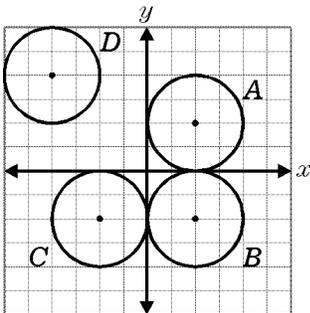
15. Two ships leave point A at 10:30 am. One travels in a direction of 049° ($N49^\circ E$) at 12 miles per hour and the other travels in a direction of 135° ($S45^\circ E$) at 14 miles per hour. How far apart, to the nearest mile, will they be at noon?

- (A) 27 (B) 26 (C) 25 (D) 28

16. The circle shown has an equation in the form of $(x - h)^2 + (y - k)^2 = 4$



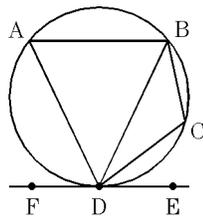
If the values of h and k were changed to opposite signs, which of the following is the graph of the new circle?



- (A) A (B) B (C) C (D) D

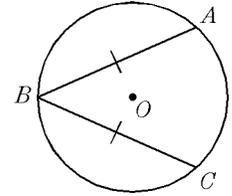
17. In the circle shown, quadrilateral $ABCD$ is inscribed in the circle. \overline{FE} is a tangent and \overline{BD} is a diagonal. If $m\angle A = 2x - 15$, $m\angle C = 3x - 25$, $m\angle BDC = 30$, and $m\angle ADF = 70$, what is $m\angle ABD$?

- (A) 70° (B) 60°
 (C) 45° (D) 50°

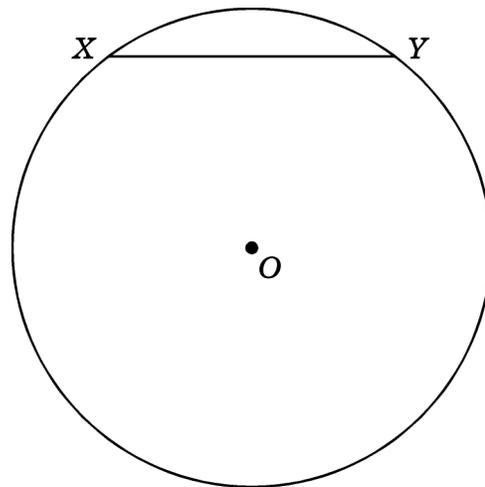


18. In the diagram, the inscribed angle $\angle ABC$ has a measure of 50° , $\overline{AB} \cong \overline{BC}$, and the radius of the circle shown is 10 units. What is the length of \widehat{AB} ?

- (A) $\frac{35\pi}{16}$ (B) $\frac{42\pi}{5}$
 (C) $\frac{65\pi}{6}$ (D) $\frac{65\pi}{9}$

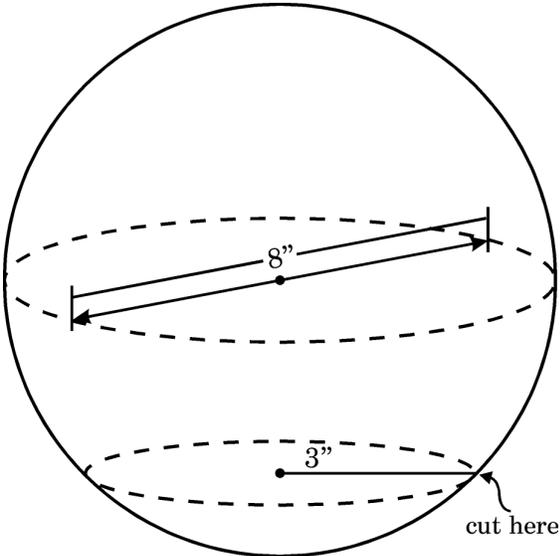


19. In the circle below, the center is O , the radius is 15 cm, and chord $XY = 18$ cm



- a) Construct \overline{OP} perpendicular to \overline{XY} , where P is a point on \overline{XY} .
 b) What is the length of \overline{OP} ?
 c) Find $m\angle XYO$ to the nearest hundredth degree.

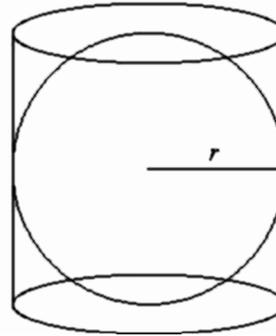
20. A florist is creating centerpieces for an awards dinner. As a base for each centerpiece, the florist uses a sphere of floral foam that has an 8 inch diameter. A horizontal slice is removed from the bottom of the sphere so that the centerpiece lies flat.



The radius of the flat surface of the slice is 3 inches. What is the approximate height of the floral foam?

- Ⓐ 8 in Ⓑ 7.5 in Ⓒ 6.5 in Ⓓ 5 in

21. The figure shows a sphere with radius r fitting exactly inside of a right cylinder. The height of the cylinder is $2r$.



Could a plane, if it intersects the sphere and the cylinder, form two concentric circles?

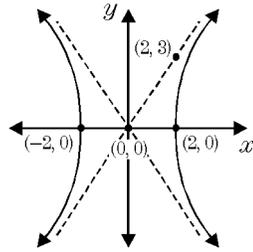
- Ⓐ No, any intersection would result in a point and a circle, or just one circle.
 Ⓑ No, any intersection would result in a circle and an oval.
 Ⓒ Yes, if the plane is parallel to the top and bottom of the cylinder and does not go through the middle.
 Ⓓ Yes, if the plane intersects the top and bottom of the cylinder and is not tangent to the side.

22. Write the equation of the parabola that opens down, has a vertex $V(-2, 51)$, and is congruent to $y = -4x^2$. Answer in the form $y = a(x - h)^2 + k$.

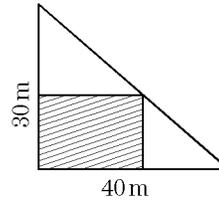
- Ⓐ $y = 4(x - 2)^2 - 51$
 Ⓑ $y = -4(x - 2)^2 - 51$
 Ⓒ $y = 4(x + 2)^2 + 51$
 Ⓓ $y = -4(x + 2)^2 + 51$

23. What is the equation of the given hyperbola?

- Ⓐ $9x^2 + 4y^2 = 36$
- Ⓑ $9x^2 - 4y^2 = -36$
- Ⓒ $9x^2 - 4y^2 = 36$
- Ⓓ $4x^2 - 9y^2 = 36$

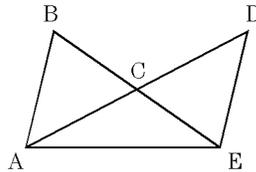


24. Vinh is thinking of buying a block of land to build a house. The land is less expensive because it is an unusual shape. It is a right-angled triangle with sides of length 30 m, 40 m, and 50 m. Vinh wants the floor plan of the house to be a rectangle with two sides along the two shorter sides of the block and one corner on the hypotenuse. What are the dimensions of the largest house that could be built on the land?



25. Given: \overline{AC} is the median to \overline{BE} ,
 \overline{EC} is the median to \overline{AD} .

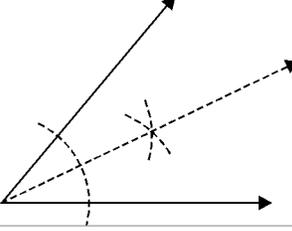
Prove: $\overline{AB} \parallel \overline{ED}$



Statements	Reasons

Problem-Attic Sample Document
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Geometry

Num	Scoring	Standard	Answer
1	B	G.CO.12	
2		G.GPE.04	$E(2, 3)$, $F(7, 4)$, $G(4, 7)$, $H(-1, 6)$; $\sqrt{26}$, $\sqrt{26}$; $3\sqrt{2}$, $3\sqrt{2}$; parallelogram
3	D	G.CO.04	all except II
4		G.CO.05	[graph]; $(0, 0)$, $(-8, 0)$, $(0, 6)$; 24 square units, area is the same.
5	A	G.CO.05	I only
6	A	G.CO.10	Assume $m\angle CDA = m\angle CDB = 90$.
7		G.C.01	[proof]
8	B	G.CO.11	$AB = DC$
9	B	G.SRT.05	4
10	D	G.SRT.08	6.4
11		G.SRT.05	118° ; $\triangle XBZ$, $\triangle XCD$, $\triangle DEZ$, $\triangle DFY$; 646 yds
12	C	G.SRT.08	$(3, 2)$
13	D	G.SRT.08	15.45 in^3
14	C	G.SRT.09	156.5
15	A	G.SRT.11	27
16	B	G.GPE.01	B
17	A	G.C.03	70°
18	D	G.C.05	$\frac{65\pi}{9}$
19		G.C.02	[task]; 12; 53.13°
20	C	G.GMD.03	6.5 in
21	C	G.GMD.04	Yes, if the plane is parallel to the top and bottom of the cylinder and does not go through the middle.
22	D	G.GPE.02	$y = -4(x + 2)^2 + 51$
23	C	G.GPE.03	$9x^2 - 4y^2 = 36$
24		G.MG.03	20 m by 15 m
25		G.CO.10	[proof]