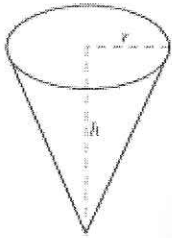


1) The volume, V , of the right circular cone with radius r and height h , shown below, can be found using the formula $V = \frac{1}{3} \pi r^2 h$. A cone-shaped paper cup has a volume of 162 cubic centimeters and a height of 9 centimeters.

What is the radius, to the nearest centimeter, of the paper cup?



Formula: $V = \frac{1}{3} \pi r^2 h$
 Substitute given info: $162 = \frac{1}{3} \pi r^2 (9)$

Multiply by 3: $(3) 162 = (3) \frac{1}{3} \pi \cdot 9 \cdot r^2$

Divide by (9π) use (π) : $\frac{486}{(9\pi)} = \frac{9\pi r^2}{(9\pi)}$

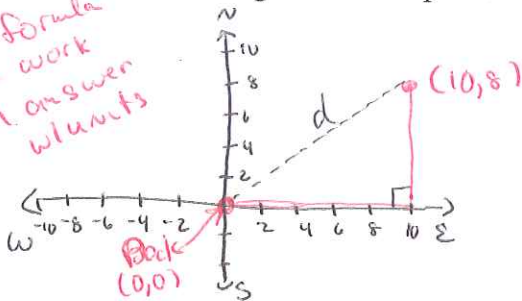
Square root to get r : $17.189 = r^2$

+1 answer w/units

$r \approx 4.1 \approx 4 \text{ cm}$

2) A boat departs Port Isabelle, Texas, traveling to an oil rig. The oil rig is located 10 miles east and 8 miles north of the boat's departure point. About how many miles is the oil rig from the departure point?

3 pts
+1 formula
+1 work
+1 answer w/units



Use Pythagorean Theorem

$a^2 + b^2 = c^2$

$8^2 + 10^2 = d^2$

$64 + 100 = d^2$

$164 = d^2$

$12.8 \text{ miles} = d$

or Distance Formula

$d = \sqrt{(10-0)^2 + (8-0)^2}$

$d = \sqrt{100 + 64}$

$d = \sqrt{164}$

$d \approx 12.8 \text{ miles}$

3) Points A, B, C, and D are on a line such that B is between A and C, and C is between B and D.

draw line, place pts w correct order

The distance from A to B is 8 units. LABEL on Line

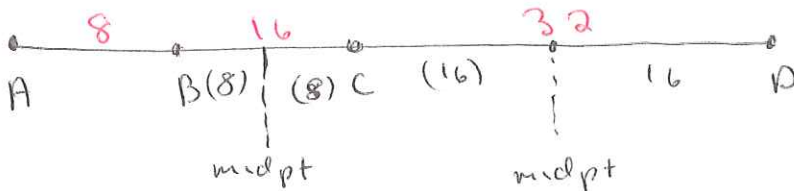
The distance from B to C is twice the distance from A to B, and the distance from C to D is twice the distance from B to C.

$16 \cdot 2 = 32$ Label on Line

$8 \cdot 2 = 16$ Label on Line

What is the distance, in units, from the midpoint of BC to the midpoint of CD?

← midpt is



1/2 way - put midpts on line

Label distances add to answer question

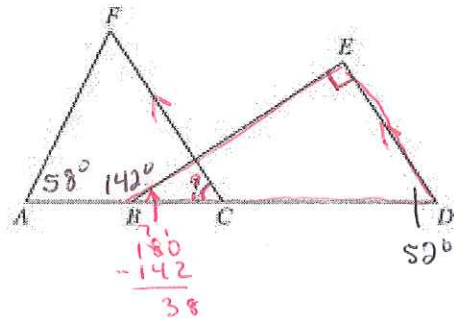
distance = $8 + 16 = 24$ units

4) In the figure below, $A, B, C,$ and D are collinear, FC is parallel to ED , BE is perpendicular to ED , and the measures of $\angle FAB$ and $\angle EBA$ are as marked.

mark given info on figure use to solve problem!

What is the measure of $\angle FCB$? identify angle

3pts



strategy:
Solve what you can, finding all missing \angle s, until answer reveals itself.

① $m\angle EBC = 180 - 142 = 38^\circ$ Linear Pair

② In $\triangle BED$ $m\angle EBC + m\angle E + m\angle D = 180$
 $38 + 90 + m\angle D = 180$
 $128 + m\angle D = 180$
 $-128 \quad -128$
 $m\angle D = 52^\circ$

③ $\angle D$ and $\angle FCB$ are corresponding angles so congruent!

$m\angle FCB = 52^\circ$

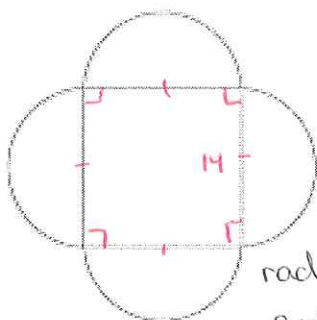
5) The geometric figure shown below consists of a square and 4 semicircles.

The diameters of the semicircles are the sides of the square, and each diameter is 14 centimeters long.

Label figure!

3pts

Which of the following is the closest approximation of the total area, in square centimeters, of this geometric figure?



radius of $\odot = \frac{14}{2} = 7$
side of $\square = 14$

Area = 1 square + 4 semicircles
 = 1 square + 2 circles
 = side² + 2(πr^2)
 = $14^2 + 2(\pi \cdot 7^2)$

$= (196 + 98\pi) \text{ cm}^2$
 $\approx 503.88 \text{ cm}^2$

exact answer
approximate
1pt answer w/units

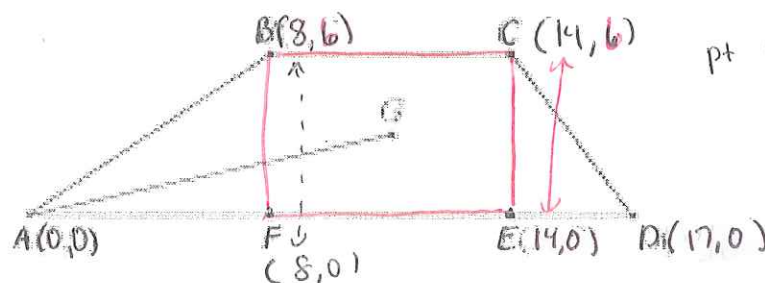
6) Quadrilateral $ABCD$ is drawn on the standard (x,y) coordinate plane as shown below, with points E and F on AD .

Point G is the center of rectangle $BCEF$.

① draw \square to better visualize
 ② Label Points

How many coordinate units long is AG ?

pt C has y coordinate like B
 x coordinate like E
 pt F on x axis so y coord. is 0
 y coordinate like B



③ Find Point G

$\frac{1}{2}$ way btwn x coordinates
 $\frac{1}{2}$ way btwn y coordinates
 $G\left(\frac{8+14}{2}, \frac{0+6}{2}\right) = (11, 3)$

④ Use DISTANCE formula to find AG

$AG = \sqrt{(11-0)^2 + (3-0)^2} = \sqrt{11^2 + 3^2} = \sqrt{121+9} = \sqrt{130} \approx 11.4$ units

3pts
show all work!
1pt each
steps 2-4