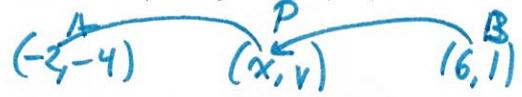


1. Find the coordinates of P along the directed line segment AB with A (-2, -4) and B (6,1) so that AP : PB = 3 : 2.



$$\frac{3}{2} = \frac{x - (-2)}{6 - x}$$

$$3(6 - x) = 2(x + 2)$$

$$18 - 3x = 2x + 4$$

$$14 = 5x \quad x = 2.8$$

$$\frac{3}{2} = \frac{y - (-4)}{1 - y}$$

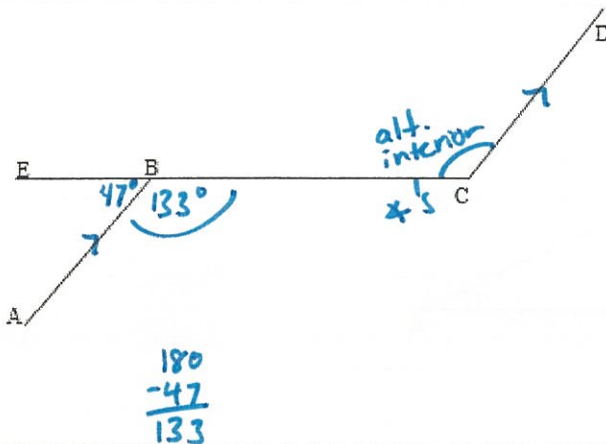
$$3(1 - y) = 2(y + 4)$$

$$3 - 3y = 2y + 8$$

$$-5 = 5y \quad y = -1$$

$$\boxed{(2.8, -1)}$$

2. In the accompanying diagram, $\overline{EB} \parallel \overline{CD}$, and $m\angle ABE = 47^\circ$. Find $m\angle DCB$.



$$\boxed{\angle DCB = 133}$$

3. The volume of a sphere is approximately 44.6022 cubic centimeters. What is the radius of the sphere, to the nearest tenth of a centimeter?

★
formulas
sheet

$$V = \frac{4}{3}\pi r^3$$

$$44.6022 = \frac{4}{3}\pi r^3$$

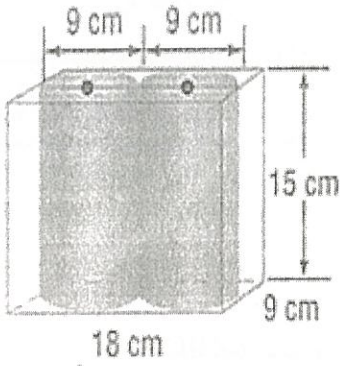
$$10.6479909 = r^3$$

$$r = 3.263125941$$

$$\boxed{3.3}$$

*formuls sheets

4. A box 18cm by 9cm by 15cm is being used to ship two cylindrical candles. Each candle has a diameter of 9cm and a height of 15cm, as shown in the diagram. What is the volume, to the nearest hundredth, of the empty space in the box?



$$(2) V = \pi r^2 h$$

$$\pi (4.5)^2 (15)$$

$$303.75 \pi$$

$$\times 2 = 607.5$$

Box $V = Bh$

$$l \times w \times h$$

$$18 \cdot 9 \cdot 15$$

$$2430$$

$$2430 - 607.5$$

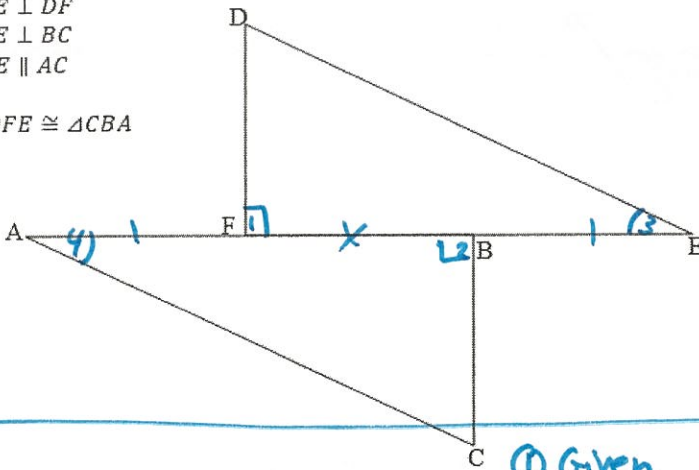
$$521.4824629$$

$$\boxed{521.48}$$

5.

Given: $AF \cong BE$
 $AE \perp DF$
 $AE \perp BC$
 $DE \parallel AC$

Prove $\triangle DFE \cong \triangle CBA$



①

② $\angle 1 \cong \angle 2$

③ $FB \cong FB$

④ $AF + FB \cong FB + BE$
 $AB \cong FE$

⑤ $\angle 3 \cong \angle 4$

⑥ $\triangle DFE \cong \triangle CBA$

① Given

② \perp lines form congruent right \angle 's

③ Reflexive Postulate

④ Addition Postulate

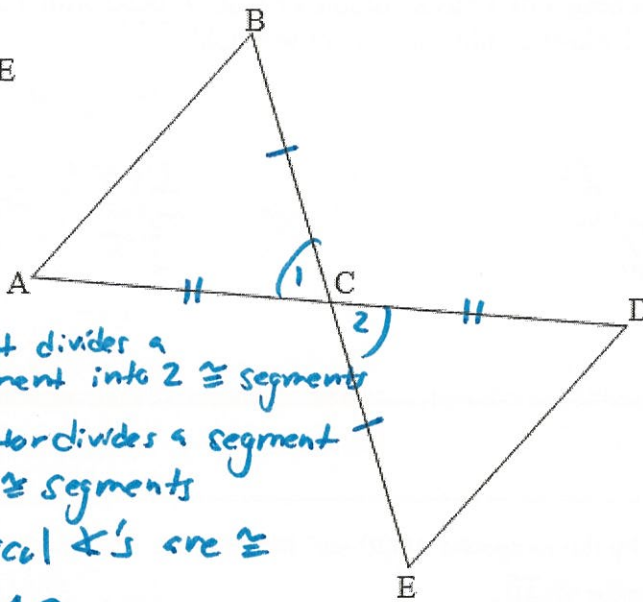
⑤ \parallel lines form \cong alternate interior \angle 's

⑥ ASA

6.

Given: C is the midpoint of BE
BE bisects AD

Prove $\triangle BCA \cong \triangle DCE$



- ① Given
- ② A midpt divides a segment into 2 \cong segments
- ③ A bisector divides a segment into 2 \cong segments
- ④ Vertical \angle 's are \cong
- ⑤ $\triangle BCA \cong \triangle DCE$ ⑤ SAS

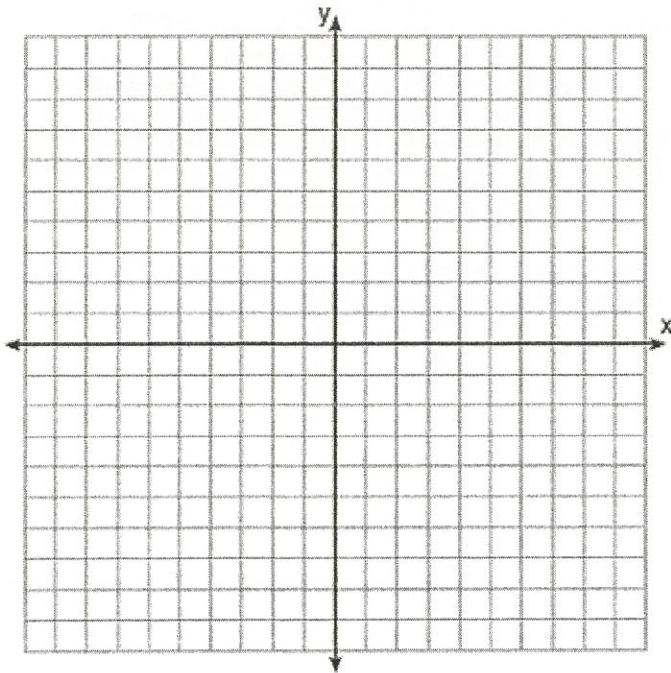
7.

The vertices of quadrilateral JKLM have coordinates $J(-3,1)$, $K(1,-5)$, $L(7,-2)$, and $M(3,4)$.

Prove that JKLM is a parallelogram.

Prove that JKLM is *not* a rhombus.

[The use of the set of axes below is optional.]



$$JK = \sqrt{(-3-1)^2 + (1-(-5))^2} = \sqrt{52}$$

$$KL = \sqrt{(1-7)^2 + (-5-(-2))^2} = \sqrt{45}$$

$$LM = \sqrt{(7-3)^2 + (-2-4)^2} = \sqrt{52}$$

$$JM = \sqrt{(-3-3)^2 + (1-4)^2} = \sqrt{45}$$

$$JK \cong LM$$

$$KL \cong JM$$

$$JK \not\cong KL$$

\therefore \square JKLM is a parallelogram because both pairs of opposite sides are \cong .

It is not a rhombus because adjacent sides are not \cong .

*formulas sheet

8. A cylinder with a height of 3 has a volume of 48π . A cone with a height of 2 has a volume of 24π . Which solid has the larger radius and by how much?

$$V = \pi r^2 h$$

$$\frac{48\pi}{3\pi} = \frac{\pi r^2 (3)}{3\pi}$$

$$16 = r^2$$

$$r = 4$$

$$V = \frac{1}{3} \pi r^2 h$$

$$\frac{24\pi}{\frac{2}{3}\pi} = \frac{\frac{1}{3}\pi r^2 (2)}{\frac{2}{3}\pi}$$

$$36 = r^2$$

$$r = 6$$

The cone has a larger radius by 2

9. If \overline{AB} is defined by the endpoints $A(4,2)$ and $B(8,6)$, write an equation of the line that is the perpendicular bisector of \overline{AB} .

midpt $\left(\frac{4+8}{2}, \frac{2+6}{2} \right) = (2, 4)$

slope $\frac{6-2}{8-4} = \frac{4}{4} = 1$

new line $m = -\frac{1}{1}$
thru $(2, 4)$

$$y = mx + b$$

$$4 = -1(2) + b$$

$$4 = -2 + b$$

$$b = 6$$

$$y = -x + 6$$

10. The coordinates of the endpoints of \overline{CD} are $C(3,8)$ and $D(6,-1)$. Express the length of \overline{CD} in simplest radical form.

distance formula
* memorize!

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(8 - -1)^2 + (3 - 6)^2}$$

$$\sqrt{81 + 9}$$

$$\sqrt{90}$$

$$\swarrow \quad \searrow$$

$$\sqrt{9} \quad \sqrt{10}$$

$$3\sqrt{10}$$