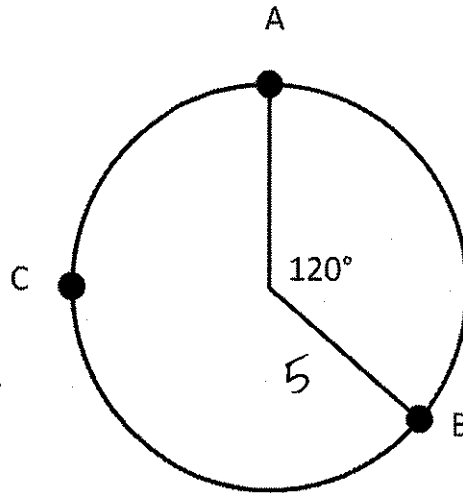


Use the diagram for problems 1-3.

1. Find measure of arc AB.

$$\boxed{120^\circ}$$



2. What is the circumference if the radius is 5.

$$2\pi(5) = \boxed{10\pi}$$

3. Find the length of arc ACB.

$$\frac{240}{360} (10\pi)$$

$$\widehat{ACB} = 20.94$$

4. Write the equation of a circle with radius 5 centered at the point (-2,-3).

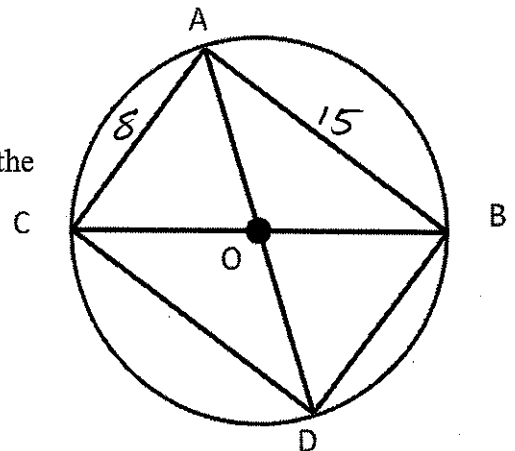
$$(x+2)^2 + (y+3)^2 = 25$$

5. If ABCD has height 8 and width 15, what is the radius of the circle.

$$\boxed{17}$$

$$8^2 + 15^2 = c^2$$

$$c = 17$$



Use the diagram to answer 6-7.

6. If  $\overline{CA} = 2x - 1$  and  $\overline{CB} = 4x - 5$ , find the radius of the circle

if  $\overline{OB} = 3x - 1$ .

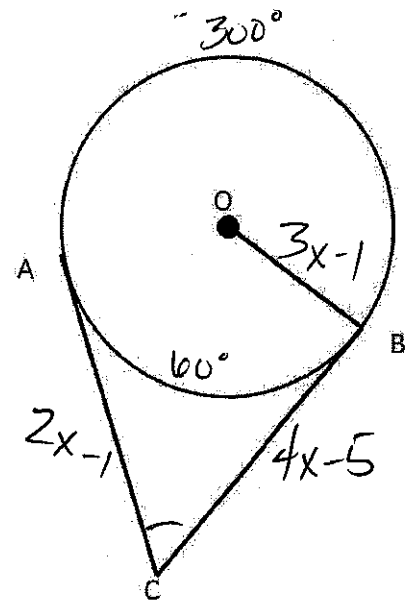
$$2x - 1 = 4x - 5$$

$$4 = 2x$$

$$x = 2$$

$$\overline{OB} = 3(2) - 1$$

$$\boxed{= 5}$$



7. If  $m\widehat{AB} = 60^\circ$ , find the measure of angle C (or angle ACB).

$$\angle C + \widehat{AB} = 180^\circ$$

$$\text{or } \angle C = \frac{1}{2}(300 - 60)$$

$$= \frac{1}{2}(240)$$

$$= \boxed{120^\circ}$$

$$\angle C + 60^\circ = 180^\circ$$

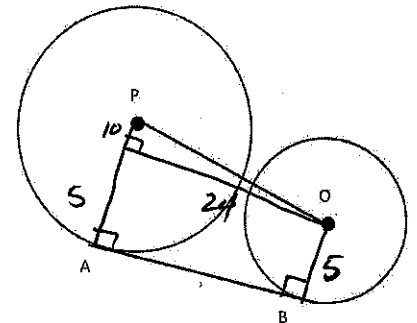
$$\angle C = 120^\circ$$

8. If  $AB = 24$ , the radius of  $O = 5$  and the radius of  $P = 15$

find  $PO$ .

$$\boxed{PO = 26}$$

$$10^2 + 24^2 = c^2$$

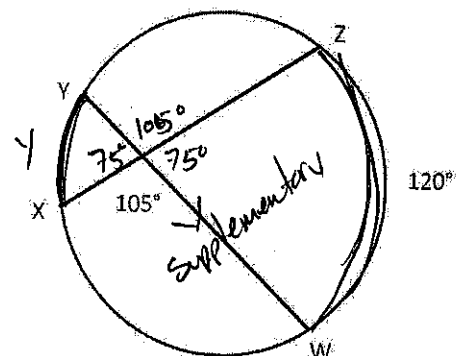


9. Find  $m\widehat{YX}$ .

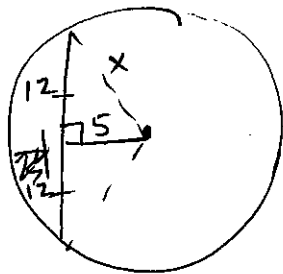
$$75^\circ = \frac{1}{2}(120 + y)$$

$$150 = 120 + y$$

$$\boxed{y = 30^\circ}$$



10. Find, to the nearest centimeter, the circumference of a circle in which a 24 cm chord is 5 cm from the center.



$$5^2 + 12^2 = x^2$$

$$25 + 144 = x^2$$

$$\boxed{x = 13}$$

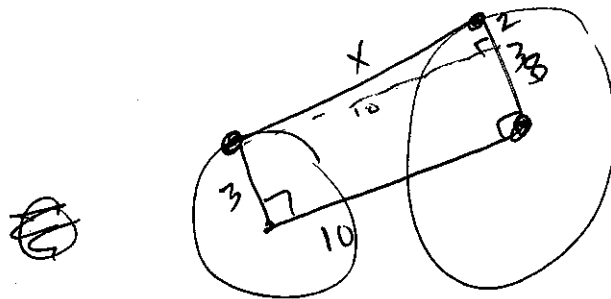
↑  
Radius

thus

Circumference  
is  $2\pi(13)$

$$\boxed{26\pi}$$

11. The centers of two circles with radii 3 and 5 are 10 units apart. Find the length of a common internal tangent.



$$2^2 + 10^2 = x^2$$

$$4 + 100 = x^2$$

$$\sqrt{x^2} = \sqrt{104}$$

$$x = \sqrt{104}$$

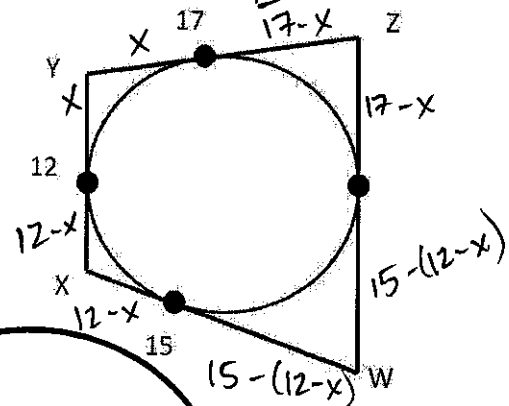
$$\boxed{= 10.19}$$

12. Find the length of segment ZW based on the image shown:

$$ZW = 17 - x + 15 - (12 - x)$$

$$= 17 - x + 15 - 12 + x$$

$$= \boxed{20}$$



13. Find the measure of angle X if the ratio of arc YW to arc WZ is 3:4.

$$3x + 4x + 80 = 160$$

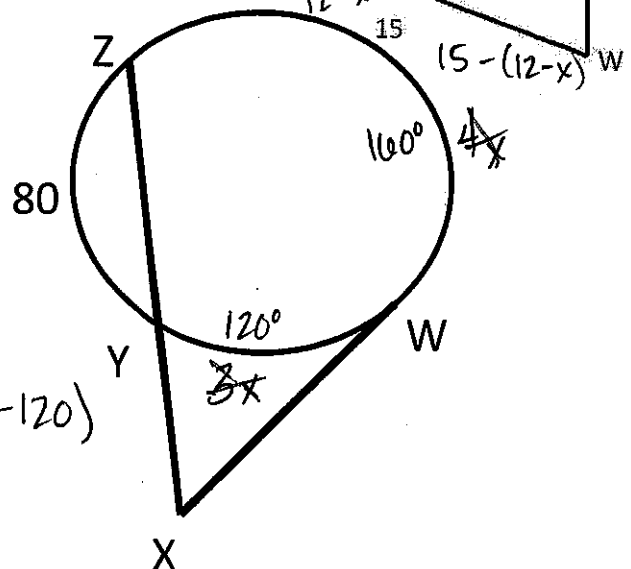
$$7x = 80$$

$$x = 40$$

$$\angle X = \frac{1}{2}(160 - 120)$$

$$= \frac{1}{2}(40)$$

$$= \boxed{20^\circ}$$



14. M is the midpoint of arc AB. Find the measure of arc CD (all measures are in degrees).

b/c  $\overline{AM} \cong \overline{MB}$ ,  $3x-31 = x+7$

$$2x = 38$$

$$x = 19$$

thus

$$\angle DMC = 4(19) - 14 = 62^\circ + \widehat{CD} = 2(62) = \boxed{124^\circ}$$

15. Find the measure of angle P (all measures are in degrees).

$$x^2 + 100 - 2x = 180$$

$$x^2 - 2x - 80 = 0$$

$$(x-10)(x+8) = 0$$

$$\boxed{x=10} \quad \boxed{x=-8}$$

16. Solve for x.

$$6(6+4) = x(x+7)$$

$$60 = x^2 + 7x$$

$$0 = x^2 + 7x - 60$$

$$0 = (x+12)(x-5)$$

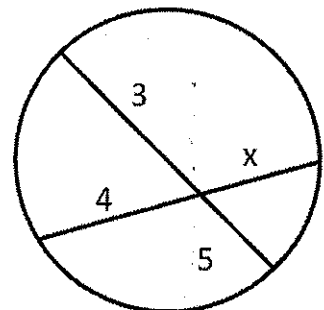
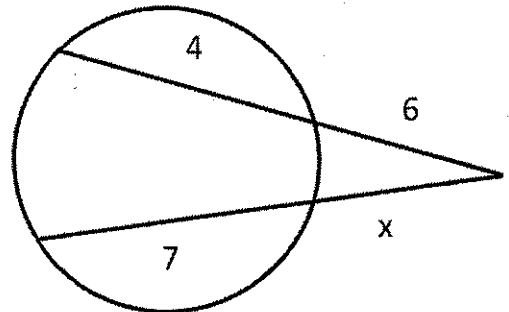
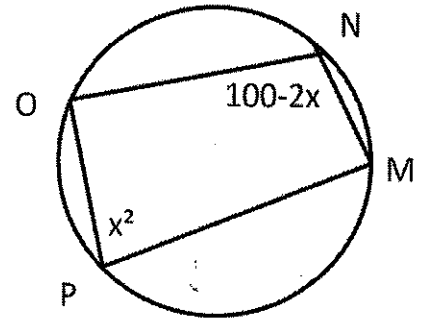
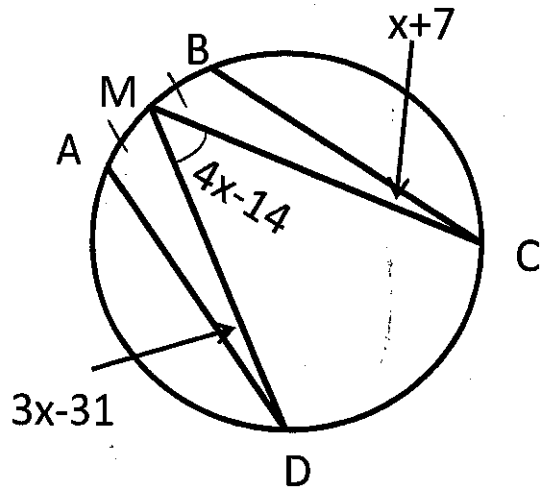
$$\cancel{x=-12} \quad \boxed{x=5}$$

17. Solve for x.

$$5 \cdot 3 = 4 \cdot x$$

$$15 = 4x$$

$$x = \frac{15}{4} = 3.75$$



only positive answer would work