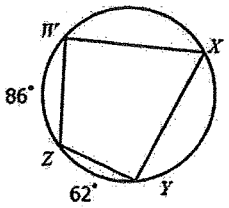
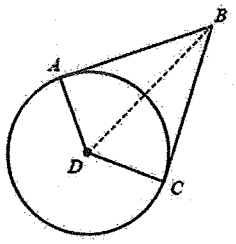
1) **Given the circle below, what is the measure of $\angle Z$?**



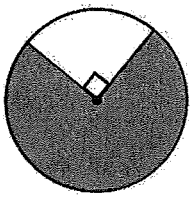
A. 74°
B. 102°
C. 106°
D. 112°

2) **If $\overline{AB}$ and $\overline{BC}$ are tangent to circle D, AB = 15 inches, and DB = 17 inches, find the perimeter of $ABCD$.**



A. 42 inches
B. 46 inches
C. 50 inches
D. 64 inches

3) **If the radius of the circle below is 9 m, find the approximate area of the shaded region.**

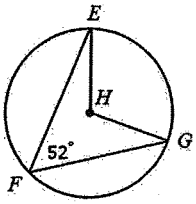


A. 152 m²
B. 163 m²
C. 178 m²
D. 191 m²

4) **Give the equation of the circle $(x + 5)^2 + (y - 1)^2 = 16$, which correctly gives the center and radius of the circle?**

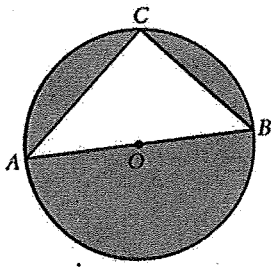
A. (5, -1); $r = 4$
B. (-5, 1); $r = 4$
C. (5, -1); $r = 8$
D. (-5, 1); $r = 8$

5) **If EH = 15 ft, what is the approximate length of $\widehat{EG}$?**



A. 24 feet
B. 27 feet
C. 30 feet
D. 32 feet

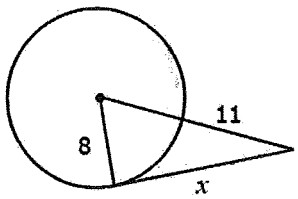
6) **Find the exact area** of the shaded region.
$AO = 5$. $AC = 8$.



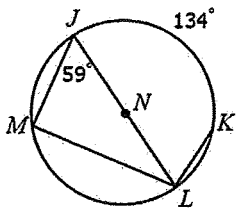
7) The equation of a circle is $x^2 + y^2 + 14x - 16y + 77 = 0$. What is the **center and radius** of the circle? Show your work to justify your answer.

a. Center: (14, -16), radius: 8.8
b. Center: (-7, 8), radius: 6
c. Center: (-14, 16), radius: 8.8
d. Center: (7, -8), radius: 5.2

8)



9) Find each measure.

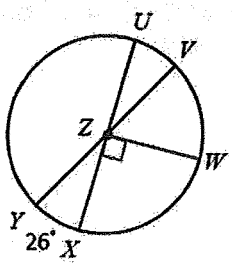


a) $m\widehat{ML}$ = _____

b) $m\angle JLK$ = _____

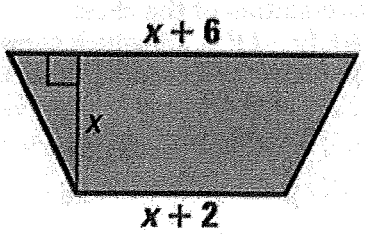
c) $m\angle JLM$ = _____

d) $m\widehat{MJ}$ = _____

If the circle below has a radius of 15 cm, find each arc length. 	10) $\overset{\frown}{VW}$	11) $\overset{\frown}{UXV}$

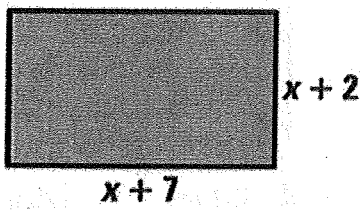
12) Set up an equation that models the diagram and then **solve it for x by factoring.**

Area of trapezoid = 32



13) Set up an equation and **solve by factoring.**

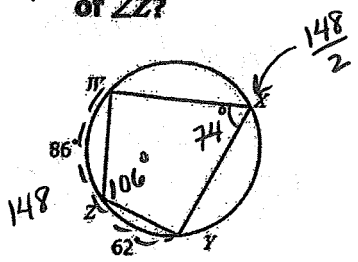
Area of rectangle = 84



14) The equation of a circle is $4x^2 + 4y^2 - 16x + 24y - 36 = 0$. Identify the center and radius of the circle. Show your work to justify your answer.

Key!

1) **Given the circle below, what is the measure of $\angle Z$?**



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B. 102°
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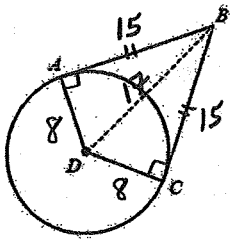
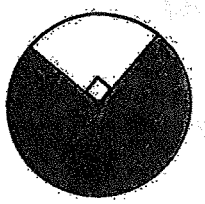


$P = 2(8) + 2(15)$
$= 46$

A. 42 inches
B. 46 inches
C. 50 inches
D. 64 inches

3) **If the radius of the circle below is 9 m, find the approximate area of the shaded region.**



$\frac{270}{360}(\pi 9^2)$

$\frac{3}{4} \cdot \frac{81\pi}{1} \sim 191 m^2$

A. 152 m²
B. 163 m²
C. 178 m²
D. 191 m²

4) **Give the equation of the circle $(x + 5)^2 + (y - 1)^2 = 16$, which correctly gives the center and radius of the circle?**

A. (5, -1); $r = 4$
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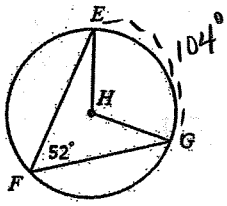
5) **If $EH = 15$ ft, what is the approximate length of $\widehat{EG}$?**



$\frac{104}{360}(2\pi(15))$

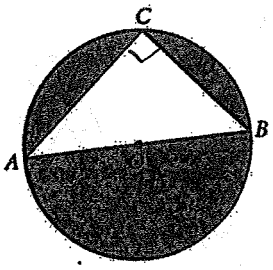
$\frac{13}{45}(30\pi)$

~ 27.23

A. 24 feet
B. 27 feet
C. 30 feet
D. 32 feet

6) **Find the exact area of the shaded region.**

$AO = 5$. $AC = 8$.



6 - 8 - 10

$A_{circle} = \pi(5)^2$
$= 25\pi$

$A_{triangle} = \frac{(6)(8)}{2}$
$= 24$

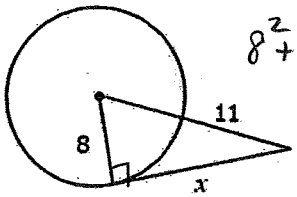
$A = 25\pi - 24$ units²

7) The equation of a circle is $x^2 + y^2 + 14x - 16y + 77 = 0$. What is the **center and radius** of the circle? Show your work to justify your answer.

a. Center: (14, -16), radius: 8.8
b. Center: (-7, 8), radius: 6
c. Center: (-14, 16), radius: 8.8
d. Center: (7, -8), radius: 5.2

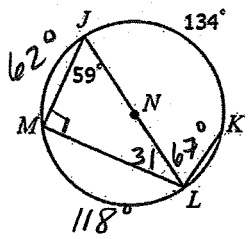
$x^2 + 14x + 49 + y^2 - 16y + 64 = -77 + 49 + 64$
$(x+7)^2 + (y-8)^2 = 36$
center: (-7, 8) radius: 6

8)



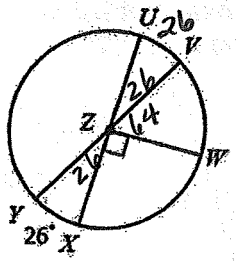
$8^2 + x^2 = 11^2$
$64 + x^2 = 121$
$x^2 = 57$
$x = \sqrt{57}$
~ 7.55

9) Find each measure.



a) $m\widehat{ML}$ = 118°
b) $m\angle JLK$ = 67°
c) $m\angle JLM$ = 31°
d) $m\widehat{MJ}$ = 62°

If the circle below has a radius of 15 cm, find each arc length.



10) $\overset{\frown}{VW}$

$\frac{64}{360}(2\pi(15))$

$\frac{8}{\cancel{45}_{3}} \cdot \frac{\cancel{30}^{2}\pi}{1} = \frac{16\pi}{3}$ cm

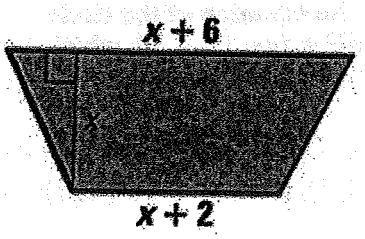
11) $\overset{\frown}{UXV}$

$\frac{334}{360}(2\pi(15))$

$\frac{167}{\cancel{180}_{6}} \cdot \frac{\cancel{30}^{1}\pi}{1}$ $\frac{167\pi}{6}$ cm

12) Set up an equation that models the diagram and then **solve it for x by factoring.**

Area of trapezoid = 32



$32 = \frac{(2x+8)x}{2}$

$32 = \frac{2x^2+8x}{2}$

$32 = x^2+4x$

$0 = x^2+4x-32$

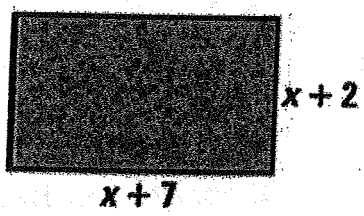
$0 = (x+8)(x-4)$

$x = 4$

-32
8 -4
4

13) Set up an equation and **solve by factoring.**

Area of rectangle = 84



$84 = (x+2)(x+7)$

$84 = x^2+9x+14$

$0 = x^2+9x-70$

-70
14 -5
9

$0 = (x+14)(x-5)$

$x = 5$

14) The equation of a circle is $4x^2 + 4y^2 - 16x + 24y - 36 = 0$. Identify the center and radius of the circle. Show your work to justify your answer.

$4x^2-16x+4y^2+24y-36=0$ (divide by 4)

$x^2-4x+y^2+6y-9=0$

$x^2-4x+4+y^2+6y+9 = 9+4+9$

$(x-2)^2+(y+3)^2=22$

center: $(2,-3)$ radius $= \sqrt{22}$