Name:_____ Period: Key

SM2H Geometry Review

1. What is the standard equation of a circle?

$(x-h)^2+(y-k)^2=r^2$

Write the equation for the following circles.

2. center $(6,-2)$
radius 4

$(x-6)^2+(y+2)^2=16$

3. center $(-5,0)$
radius 2

$(x+5)^2+y^2=4$

4. center $(-1,1)$
radius $\sqrt{5}$

$(x+1)^2+(y-1)^2=5$

Complete the square to identify the center and radius of the circle.

5. $x^2+6x+y^2-8y-11=0$

$x^2+6x+9 \quad +y^2-8y+16 = 11+9+16$
$(x+3)^2+(y-4)^2=36$

center $(-3,4)$

radius 6

6. $x^2-2x+y^2+6y+6=0$

$x^2-2x+1 \quad +y^2+6y+9 = -6+1+9$
$(x-1)^2+(y+3)^2=4$

center $(1,-3)$

radius 2

7. $x^2+y^2-10y=24$

$x^2 + y^2-10y+25 = 24+25$
$x^2+(y-5)^2=49$

center $(0,5)$

radius 7

8. How are inscribed angles related to their intercepted arcs?

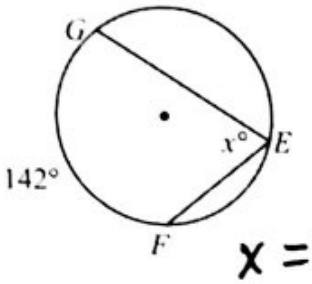
Inscribed angles are half their intercepted arcs.

9. What is the relationship between the opposite angles of an inscribed quadrilateral?

Supplementary

Find the measure of the indicated arc or angle.

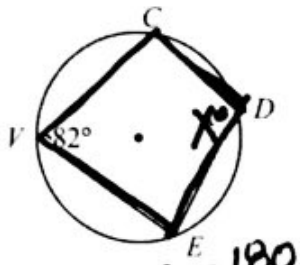
10.



$x = 142 \div 2$

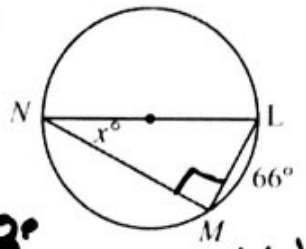
$x = 71°$

11.



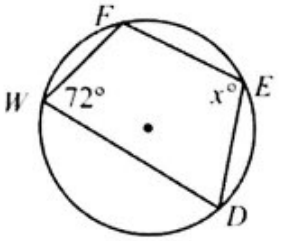
$x = 180 - 82 = 98°$

12.



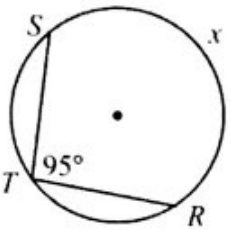
$x = 66 \div 2 = 33°$

13.



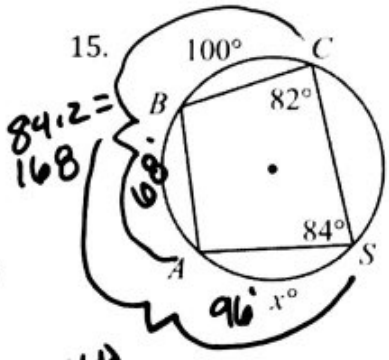
$x = 180 - 72 = 108$

14.



$x = 95 \cdot 2 = 190°$

15.

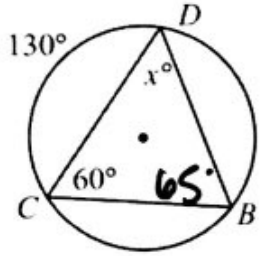


$84.2 = 168$

$168 - 68 = 100$

$x = 96°$

16.

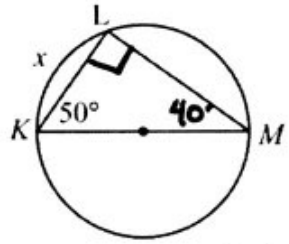


$x = 55°$

$m\angle B = 130 \div 2 = 65°$

$180 - 60 - 65 = 55°$

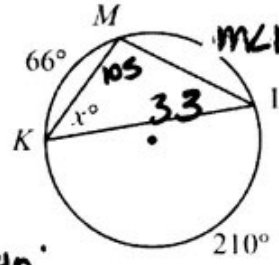
17.



$m\angle M = 180 - 50 - 90 = 40°$

$x = 40 \cdot 2 = 80°$

18.



$m\angle M = 210 \div 2$

$x = 180 - 105 - 33$

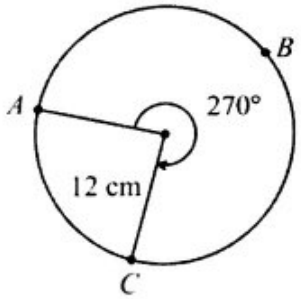
$x = 42°$

19. What is the formula used to find arc length?

$\text{Arc Length} = \frac{\theta}{360} \cdot 2\pi r$

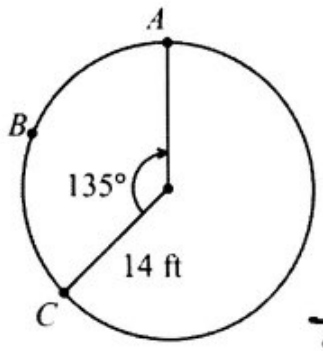
Find the length of each described arc. Leave your answers in terms of π.

20. $m\overset{\frown}{ABC}$ =



$\frac{270}{360} \cdot \frac{2\pi \cdot 12}{1} = \frac{6480\pi}{360} = 18\pi \text{ cm}$

21. $m\overset{\frown}{ABC}$ =



$\frac{135}{360} \cdot \frac{2\pi \cdot 14}{1} = \frac{3780\pi}{360}$

$\frac{21\pi}{2}$ ft

22. $r = 8\,m,\ \theta = 285°$

$\frac{285}{360} \cdot \frac{2\pi 8}{1} = \frac{4560\pi}{360}$

$\frac{38\pi}{3}\ m$

23. $r = 11\,ft,\ \theta = 90°$

$\frac{90}{360} \cdot \frac{2\pi \cdot 11}{1} = \frac{1980\pi}{360}$

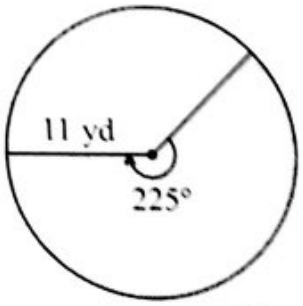
$\frac{11\pi}{2}\ ft$

24. What is the formula used to find the area of a sector?

$\frac{\theta}{360} \cdot \pi r^2$

Find the area of each described or shaded sector. Leave your answers in terms of π.

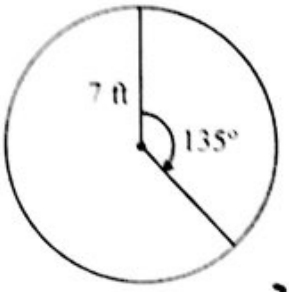
25.



$\frac{225}{360} \cdot \frac{\pi \cdot 11^2}{1} = \frac{27225\pi}{360}$

$\frac{605\pi}{8}\ yd^2$

26.



$\frac{135}{360} \frac{\pi \cdot 7^2}{1} = \frac{6615\pi}{360} = \frac{147\pi}{8}\ ft^2$

27. $r = 6\,mi,\ \theta = 55°$

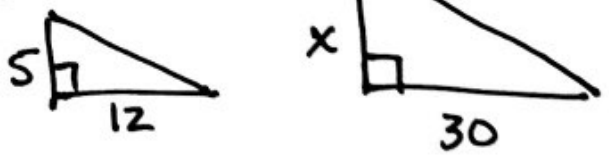
$\frac{55}{360} \cdot \frac{\pi \cdot 6^2}{1} = \frac{1980\pi}{360} = \frac{11\pi}{2}\ mi^2$

28. $r = 13\,in,\ \theta = 210°$

$\frac{210}{360} \cdot \frac{\pi \cdot 13^2}{1} = \frac{35490\pi}{360} = \frac{1183\pi}{12}\ in^2$

Use similar triangles to solve the following problems. Round your answers to the nearest tenth.

29. A 5-ft tall person casts a shadow that is 12-ft long. A nearby tree casts a shadow that is 30-ft long. How tall is the tree?

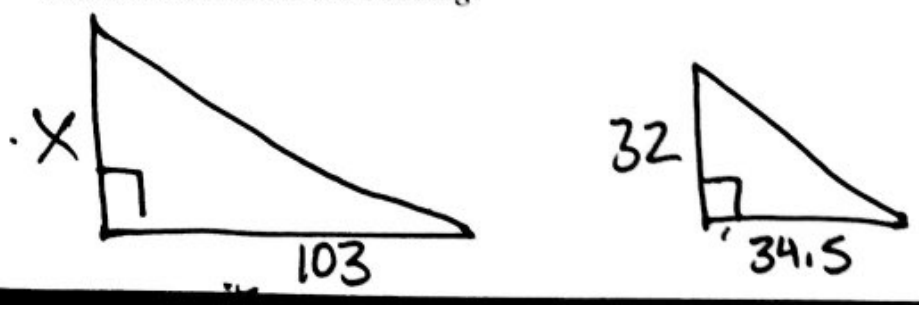


$\frac{5}{x} \times \frac{12}{30}$

$12x = 450$

$x = 37.5\ ft$

30. A building casts a 103-foot shadow at the same time that a 32-foot flagpole casts as 34.5-foot shadow. How tall is the building?



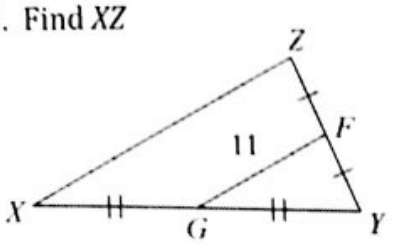
$\frac{x}{32} = \frac{103}{34.5}$

$\frac{34.5x}{34.5} = \frac{3296}{34.5}$

$x = 95.5\ ft$

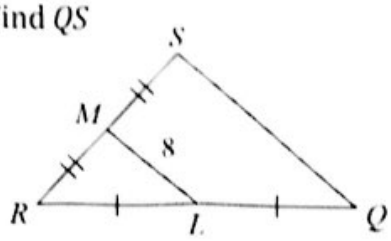
Find the missing length indicated.

31. Find XZ



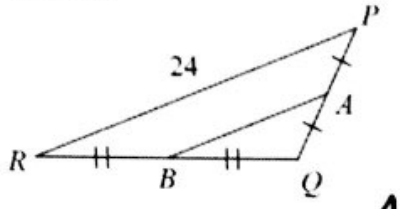
$XZ = 11 \cdot 2 = 22$

32. Find QS



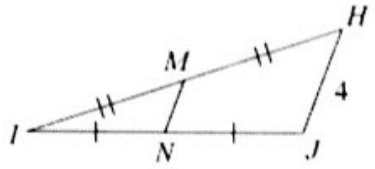
$QS = 8 \cdot 2 = 16$

33. Find AB



$AB = 24 \div 2 = 12$

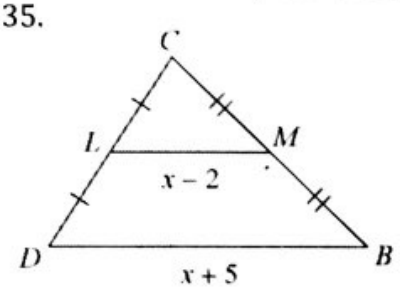
34. Find MN



$MN = 4 \div 2 = 2$

Solve for *x*. Show your work!

35.

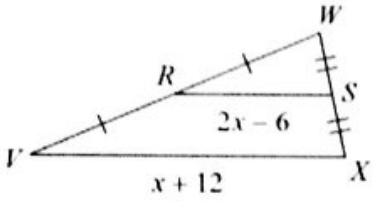


$2(x-2) = x+5$

$2x-4 = x+5$

$x = 9$

36.



$2(2x-6) = x+12$

$4x-12 = x+12$

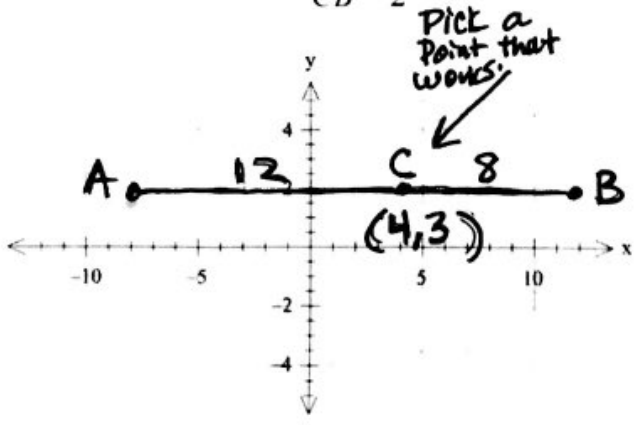
$3x = 24$

$x = 8$

$C(x, y)$

37. Given a segment with endpoints $A(-8, 3)$ and $B(12, 3)$, find the coordinates of point C between A and B so that the ratio $\frac{AC}{CB} = \frac{3}{2}$. Plot the points to help solve the problem.

(4, 3)



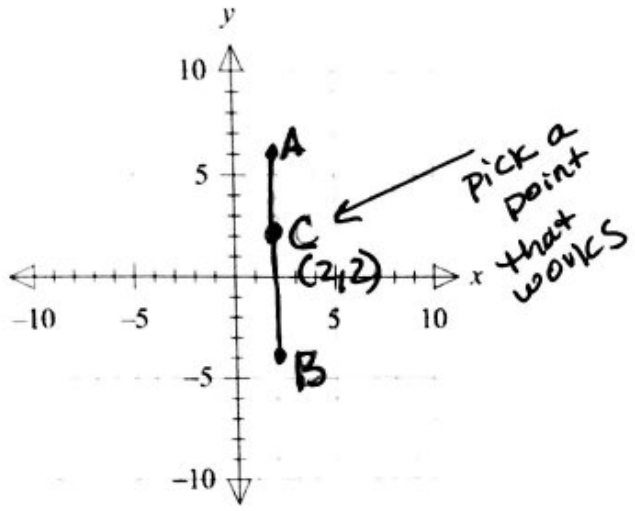
$AB = 20$

$2AC = 3CB$

$2 \cdot 12 = 3 \cdot 8$

$24 = 24$

8. Given a segment with endpoints $A(2,6)$ and $B(2,-4)$, find the coordinates of point C between A and B so that the ratio $\frac{AC}{CB}=\frac{2}{3}$. Plot the points to help solve the problem.



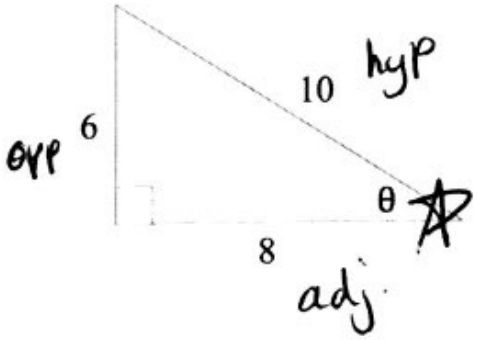
$3AC = 2CB$

$3 \cdot 4 \quad 2 \cdot 6$

$12 = 12$

$C = (2,2)$

39. Find $\sin\theta$, $\cos\theta$, and $\tan\theta$. Give answers as simplified fractions.



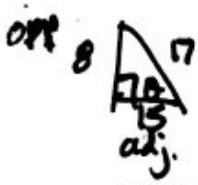
$\sin\theta = \frac{6}{10} = \frac{3}{5}$

$\cos\theta = \frac{8}{10} = \frac{4}{5}$

$\tan\theta = \frac{6}{8} = \frac{3}{4}$

Find the value of the trigonometric function indicated, given the following information.

40. If $\sin\theta = \frac{8}{17}$, what is $\cos\theta$?



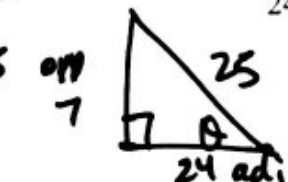
$8^2 + x^2 = 17^2$

$x^2 = 225$

$x = 15$

$\cos\theta = \frac{15}{17}$

41. If $\tan\theta = \frac{7}{24}$, what is $\sin\theta$?



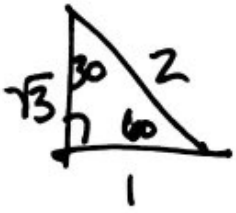
$7^2 + 24^2 = x^2$

$625 = x^2$

$25 = x$

$\sin\theta = \frac{7}{25}$

42. If $\cos(60°) = \frac{1}{2}$, find $\sin(30°)$.



$\sin 30 = \frac{1}{2}$

43. If $\sin(60°) = \frac{\sqrt{3}}{2}$, find $\cos(30°)$.

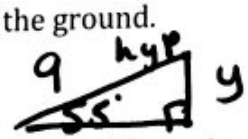
$\cos 30 = \frac{\sqrt{3}}{2}$

44. A person is 75 feet from the base of a barn. The angle formed from the person to the top of the barn is 60°. How tall is the barn?

$75\sqrt{3}$ ft. or 129.90 ft

45. As it leans against a building, a 9-meter ladder makes an angle of 55° with the ground.

a. How far is the bottom of the ladder from the base of the building?



$\cos 55 = \frac{x}{9}$ $\quad x = 9\cos 55$

$x = 5.16$ m

b. How far up the building does the ladder reach?

$\sin 55 = \frac{y}{9}$

$y = 9\sin 55$

$y = 7.37$ m

46. A 15-foot-long ladder is propped against a building. The top of the ladder touches the building at a point that is 13 feet above the ground. What angle does the ladder make with the ground?

$\sin\theta = \frac{13}{15}$

$\theta = \sin^{-1}\left(\frac{13}{15}\right)$

$\theta = 60.07°$