Unit 6 Circles Review Worksheet #1
Honors Math 3

Name: McG Key

#8 $\overset{\frown}{PE}$ arc means

Omit #9

correct answers #10 - 120

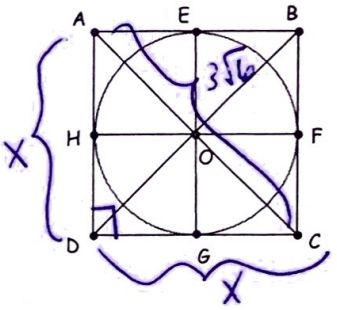
1. $\odot O$ is inscribed in square ABCD. If $AC = 3\sqrt{6}$, then $AH = \frac{3\sqrt{3}}{2}$.

$x^2 + x^2 = (3\sqrt{6})^2$

$2x^2 = 54$

$\sqrt{x^2} = \sqrt{27}$

$x = 3\sqrt{3}$



2. If circle O is inscribed in $\triangle ABC$ and the perimeter of $\triangle ABC$ is 48, find AC.

$8x^2 + 12x + 20.5 = 48$

$8x^2 + 12x - 27.5 = 0$

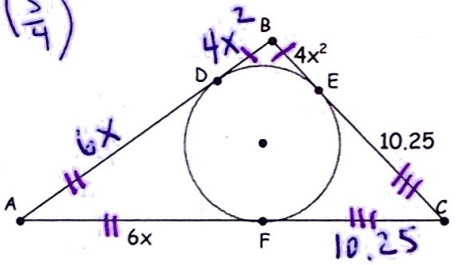
$16x^2 + 24x - 55 = 0$

$(4x - 5)(4x + 11) = 0$

$x = \frac{5}{4}, -\frac{11}{4}$

$AC = 10.25 + 6\left(\frac{5}{4}\right)$

$AC = 17.75$



3. In $\odot O$, if $\overset{\frown}{AB} = 2x^2$, $\overset{\frown}{CD} = 6 - x$ and $\triangle AOB \cong \triangle COD$, find two possible values for $\overset{\frown}{AB}$.

$2x^2 = 6 - x$

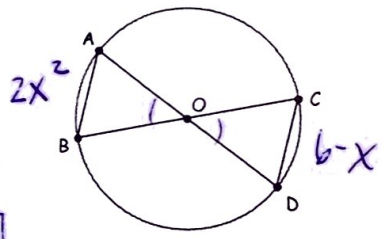
$2x^2 + x - 6 = 0$

$(2x - 3)(x + 2) = 0$

$x = \frac{3}{2}, -2$

$m\overset{\frown}{AB} = 8, 4.5$

$2\left(\frac{3}{2}\right)^2 = 2\left(\frac{9}{4}\right) = 4.5 \quad | \quad 2(-2)^2 = 8$



4. If $\overline{AD}$ and $\overline{BE}$ are diameters of $\odot O$ and $\overset{\frown}{BD} \cong \overset{\frown}{AE}$, then $m\overset{\frown}{FBC} = 190$.
(Note: F, O, and C are not collinear)

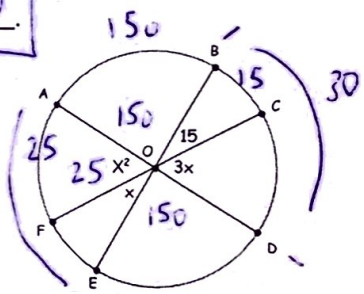
$x^2 + x = 15 + 3x$

$x^2 - 2x - 15 = 0$

$(x + 3)(x - 5) = 0$

$x = -3, 5$

$25 + 150 + 15$



5. In $\odot O$, $m\angle A = 90 - 3x$ and $m\angle BOD = x^2 + 5x$. If $m\angle A$ is acute, find $m\angle C$.

$2(90 - 3x) = x^2 + 5x$

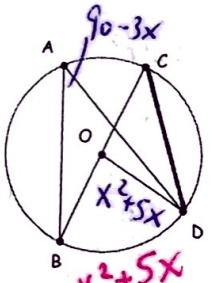
$180 - 6x = x^2 + 5x$

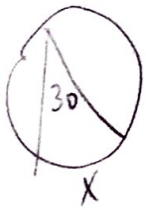
$0 = x^2 + 11x - 180$

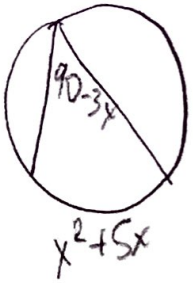
$0 = (x - 9)(x + 20)$

$x = 9, -20$

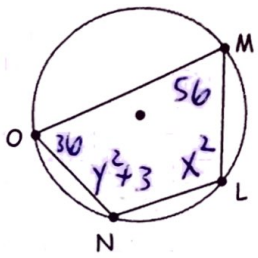
$m\angle A = 90 - 3(9) = 90 - 27 = 63 = m\angle C$







6. Quadrilateral ONLM is inscribed in the circle. If $m\angle N = y^2 + 3$, $m\angle M = 56$, $m\angle L = x^2$, and $m\angle O = 36$, find the positive values for x and y.



$x^2 + 36 = 180$

$x^2 = 144$

$x = \pm 12$

$y^2 + 3 + 56 = 180$

$y^2 + 59 = 180$

$y^2 = 121$

$y = \pm 11$

7. Find the measure of the smaller angle formed by two chords which intersect within a circle if the intercepted arcs have measures of 2x and 7x + 25 and the non-intercepted arcs have measures of 4x + 30 and 6x + 20.

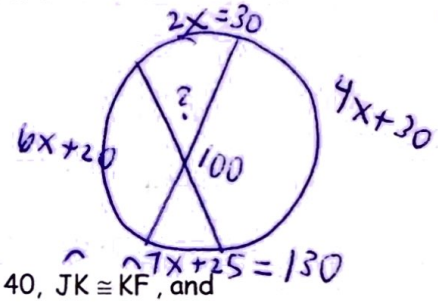
$2x + 4x + 30 + 7x + 25 + 6x + 20 = 360$

$19x + 75 = 360$

$19x = 285$

$x = 15$

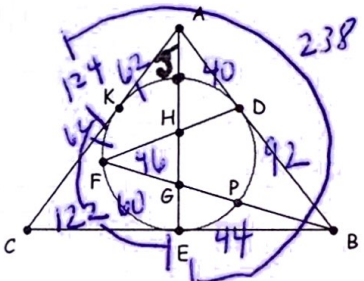
$\frac{1}{2}(30 + 130) = \frac{1}{2}(160) = 80^\circ$



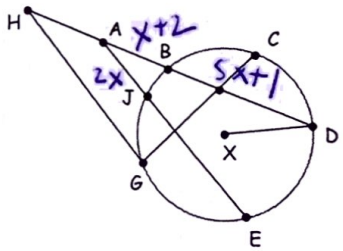
8. $\triangle ABC$ is circumscribed about the circle. If $m\overset{\frown}{PE} = 44$, $m\overset{\frown}{JF} = 124$, $m\overset{\frown}{DJ} = 40$, $JK \cong KF$, and $m\angle BFD = 46$, find $m\angle C$.

$m\angle C = \frac{1}{2}(238 - 122)$

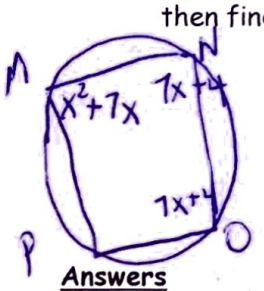
$= \frac{1}{2}(116) = 58^\circ$



9. If AB = x + 2, BD = 5x + 1, AJ = 2x and JE = 3x + 2, find AB to the nearest tenth. Use the quadratic formula to solve this equation.



10. If quadrilateral MNOP is inscribed in a circle and $m\angle M = x^2 + 7x$, $m\angle N = 7x + 4$, $m\angle O = 7x + 4$, then find the measure of all 4 angles.



$x^2 + 7x + 7x + 4 = 180$

$x^2 + 14x - 176 = 0$

$(x - 8)(x + 22) = 0$

$x = 8, -22$

$m\angle M = 64 + 56 = 120$

$m\angle N = 60$

$m\angle O = 60$

$m\angle P = 120$

Answers

1. $\frac{3\sqrt{3}}{2}$ 2. $\frac{71}{4}$ 3. $\frac{9}{2}$ or 8 4. 190 5. 63 6. x = 12 ; y = 11 7. 80 8. 58 9. 5.2 10. 12, 60, 60, 120