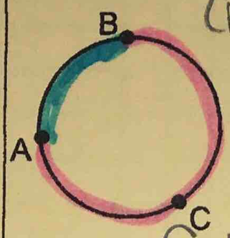
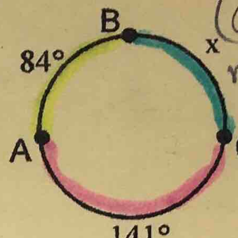
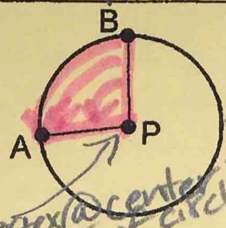
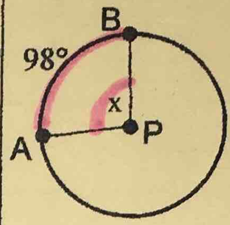
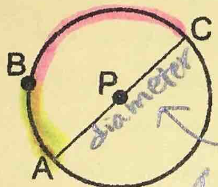
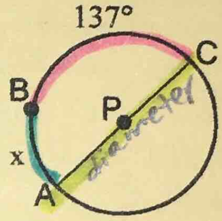
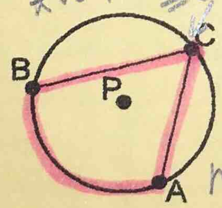
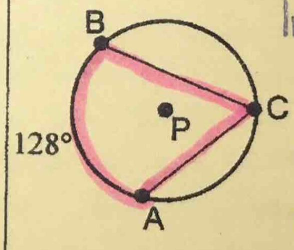
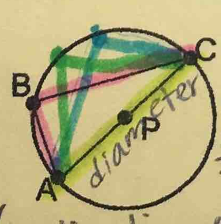
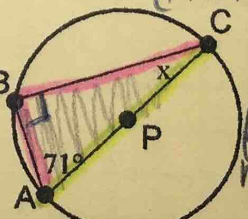
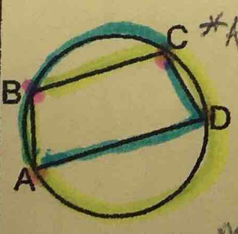
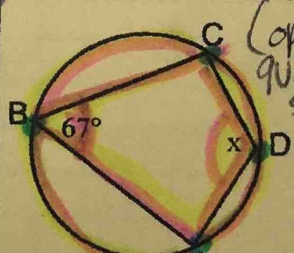
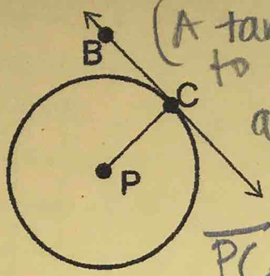
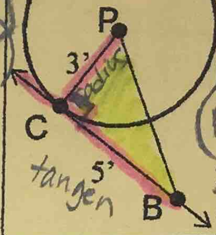
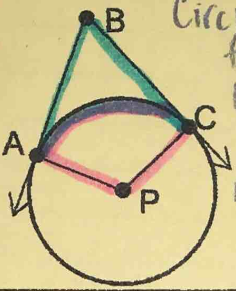
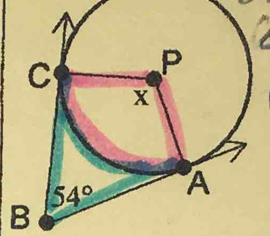
Circle Justifications

Justification	Diagram/Set Up	Example
Circle = 360°	 (pieces of arc that together form circle) $m\widehat{AB} + m\widehat{BCA} = 360°$	 (circle = 360°) $m\widehat{AB} + m\widehat{BC} + m\widehat{CA} = 360°$ $84 + x + 141 = 360$ $x + 225 = 360$ $x = 135° = m\widehat{BC}$
Central ∠ = Arc Measure	 doesn't matter where we measure the degrees of the angle! vertex @ center of circle! $m\angle APB = m\widehat{AB}$	 central ∠ = arc measure $m\angle APB = m\widehat{AB}$ $x = 98° = m\angle APB$
Semicircle = 180°	 $m\widehat{AB} + m\widehat{BC} = 180°$ *diameter cuts a circle in HALF	 semicircle = 180° $m\widehat{AB} + m\widehat{BC} = 180°$ $x + 137 = 180$ $x = 43° = m\widehat{AB}$
Inscribed ∠ Thm	*vertex on circle!  $m\angle ACB = \frac{1}{2} m\widehat{AB}$ OR $m\widehat{AB} = 2(m\angle ACB)$	 Inscribed ∠ Thm $m\angle ACB = \frac{1}{2} m\widehat{AB}$ $m\angle ACB = \frac{1}{2}(128°)$ $m\angle ACB = 64°$
Inscribed ∠ of Semicircle = 90°	 $m\angle ABC = 90°$ ANY ∠ inscribed in a semicircle (combination of semicircle = 180° & inscribed ∠ thm)	(inscribed ∠ of semicircle = 90°)  $m\angle ABC = 90°$ (Δ sum thm) $m\angle A + m\angle B + m\angle C = 180°$ $71° + 90° + x = 180°$ $x = 19° = m\angle C$
Opposite ∠s of a cyclic quadrilateral are supplementary	 *All vertices ON the circle! $m\angle B + m\angle D = 180°$ OR $m\angle A + m\angle C = 180°$	 (opposite ∠s in cyclic quadrilateral are supplementary) $m\angle B + m\angle D = 180°$ $67° + x = 180°$ $x = 113° = m\angle D$

Circle Justifications

<table>
<tr><td>Tangent Radius Thm</td><td>
(A tangent & radius to point of tangency are perpendicular)
$\overline{PC} \perp \overline{BC}$</td><td>
(tangent radius thm)
$\overline{PC} \perp \overline{BC}$
$m\angle PCB = 90^\circ$ (def. of $\perp$)
(Pythagorean Thm)
$3^2+5^2=(PB)^2$
$9+25=(PB)^2$
$PB=\sqrt{34}$ ft
$PB \approx 5.83$ ft</td></tr>
<tr><td>Circumscribed ∠ & Central ∠
(w/ same intercepted arc)
are supplementary</td><td>
Circumscribed ∠ is formed OUTSIDE ⊙ by tangent lines!
$m\angle ABC + m\angle APC = 180^\circ$</td><td>
circumscribed ∠ & central ∠ are supplementary
$m\angle ABC + m\angle APC = 180^\circ$
$54^\circ + x = 180^\circ$
$x = 126^\circ = m\angle APC$</td></tr>
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