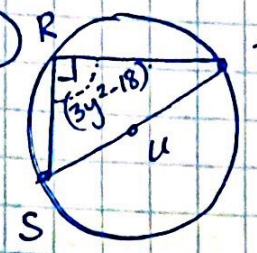
12.4 p.825-827 (17-27 all, 39-42 all, 45)

17.



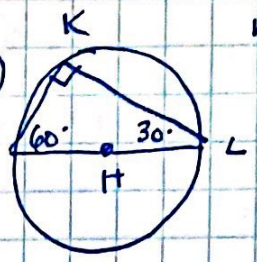
$3y^2 - 18 = 90$

$3y^2 = 108$

$y^2 = 36$

$y = \pm 6$ both values check!

18.



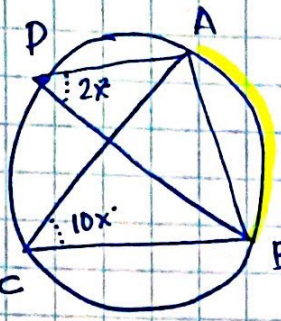
$m\angle J = (6z-4)$

$6z - 4 = 60$

$6z = 64$

$z = \frac{64}{6} = \frac{32}{3}$ or $10\frac{2}{3}$

19.



$\angle D \cong \angle C$

both angles open up to $\overset{\frown}{AB}$ inscribed

$2x^2 = 10x$

$x^2 = 5x$

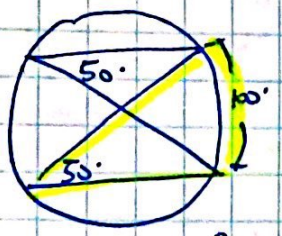
$0 = x^2 - 5x$

$0 = x(x-5)$

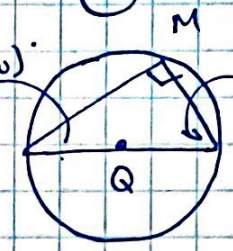
$x \neq 0$ or $x = 5$

$m\angle D = m\angle C = 50°$

$m\overset{\frown}{AB} = 100°$



20.



$3x - 10 + \frac{11x}{3} = 90$

$3\left(3x - 10 + \frac{11x}{3} = 90\right)$

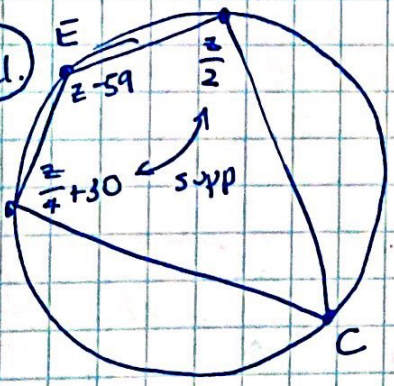
$9x - 30 + 11x = 270$

$20x = 300$

$x = 15$

$m\angle MPN = \frac{11(15)}{3} = 55°$

21.



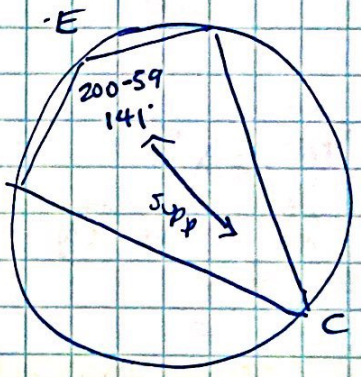
$\frac{z}{2} + \frac{z}{4} + 30 = 180$

$4\left(\frac{z}{2} + \frac{z}{4} + 30 = 180\right)$

$2z + z + 120 = 720$

$3z = 600$

$z = 200$



$m\angle E = 141°$

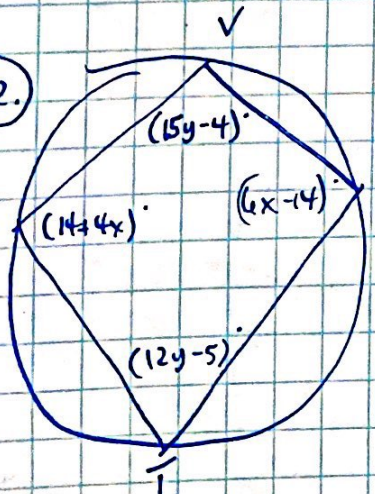
$180 - 141$

$m\angle C = 39°$

$m\angle B = 100°$

$m\angle D = 80°$

22.



$\angle V$ supp $\angle T$

$15y - 4 + 12y - 5 = 180$

$27y - 9 = 180$

$27y = 189$

$y = 7$

$m\angle V = 15(7) - 4 = 101°$

$m\angle T = 12(7) - 5 = 79°$

$\angle U$ supp $\angle W$

$14 + 4x + 6x - 14 = 180$

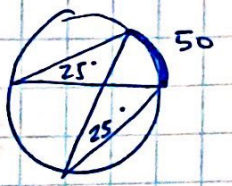
$10x = 180$

$x = 18$

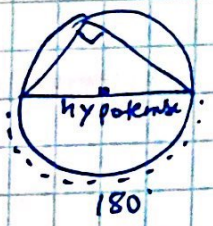
$m\angle U = 14 + 4(18) = 86°$

$m\angle W = (6(18) - 14) = 94°$

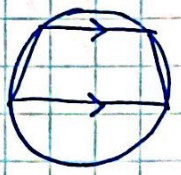
(23.) Always
~~True~~ – see corollary 12-4-2 or



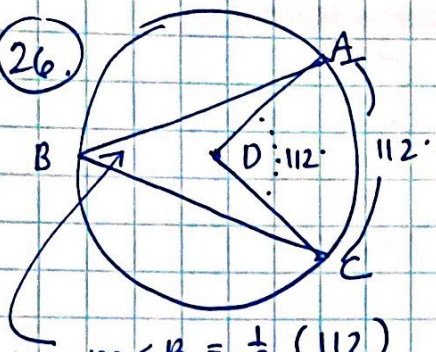
(24.) Never – the hypotenuse is the diameter, never a leg



(25) Sometimes, can have 1 set opp. sides //

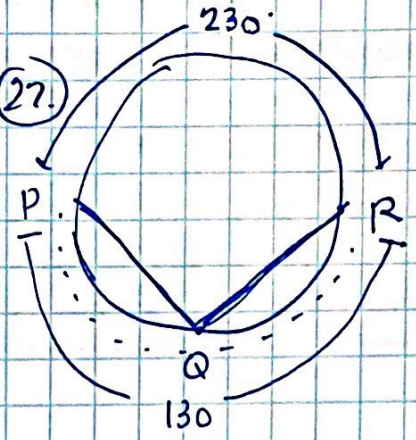


(26.)



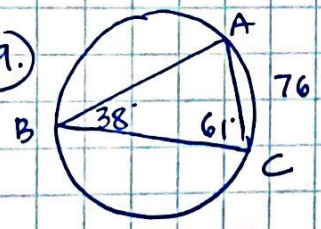
$m\angle B = \frac{1}{2}(112)$
$= 56°$

(27.)



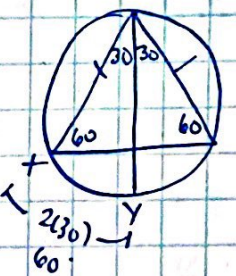
$m\angle Q = \frac{1}{2}(230°)$
$= 115°$

(39.)



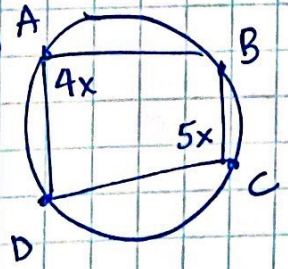
$m\angle B = \frac{1}{2}(76)$
$= 38°$
$m\angle BAC = 180 - 38 - 61$
$= \boxed{81°}$ D

(40)



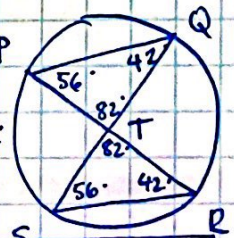
$m\overset{\frown}{XY} = 2(30)$
$= 60°$
H.

(41.)



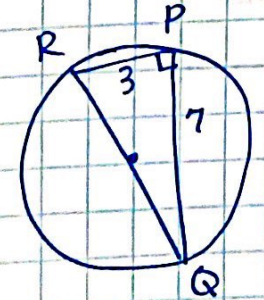
ratio of $m\angle A$ to $m\angle C$ is 4:5
let $m\angle A = 4x$
$m\angle C = 5x$
$\angle A$ supp $\angle C$
$4x + 5x = 180$
$9x = 180$
$x = 20$
$m\angle A = 4(20) = \boxed{80°}$ C

(42.)



$\boxed{m\angle STR = 82°}$ F.
$m\angle QPR = 56°$
$m\angle QSR = 56°$
$m\angle PQS = 42°$

(45.)



First find $m\angle R$

$\tan R = \frac{7}{3}$

$\tan^{-1}(7 \div 3) \approx 66.8°$

$m\overset{\frown}{PQ} = 2(66.8°) = 133.60°$
$= \boxed{134°}$