Geometry Chapter 8, 10 Cumulative Review

Name Key

1. Find the sum of the interior angles of a convex decagon. → 10 sides

$(10-2)180° = (8)180° = 1440°$

2. Find the sum of the exterior angles of a convex pentagon.

$360°$

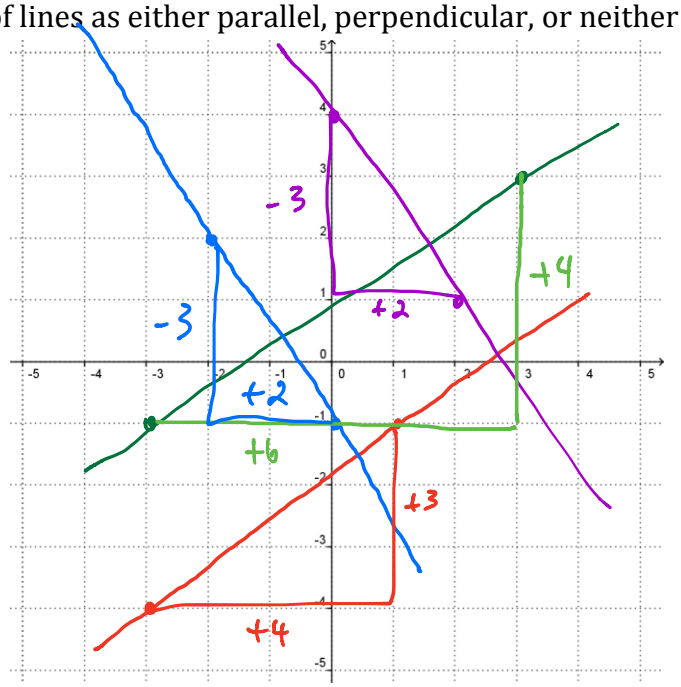
3. Find the measure of each interior angle of a regular 16-gon.

$\frac{(16-2)180°}{16} = \frac{(14)180°}{16} = \frac{2520°}{16} = 157.5°$

4. Find the measure of each exterior angle of a regular nonagon. → 9 sides

$\frac{360°}{9} = 40°$

5. Find the slope of each line. Classify each pair of lines as either parallel, perpendicular, or neither parallel nor perpendicular.
   - Line 1: (-3, -1) and (3, 3)
   - Line 2: (-2, 2) and (0, -1)
   - Line 3: (0, 4) and (2, 1)
   - Line 4: (-3, -4) and (1, -1)



slope of line 1 $= \frac{3-(-1)}{3-(-3)} = \frac{4}{6} = \frac{2}{3}$

slope of line 2 $= \frac{-1-2}{0-(-2)} = \frac{-3}{2}$

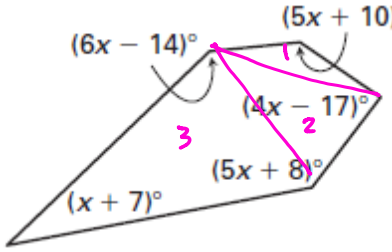
slope of line 3 $= \frac{1-4}{2-0} = \frac{-3}{2}$

slope of line 4 $= \frac{-1-(-4)}{1-(-3)} = \frac{3}{4}$

line 1 and line 2 are perpendicular
line 1 and line 3 are perpendicular
line 1 and line 4 are neither

line 2 and line 3 are parallel
line 2 and line 4 are neither
line 3 and line 4 are neither

6. Solve for x in the diagram.

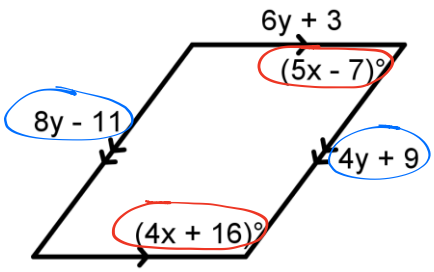


Sum of interior angles in a pentagon:
$(5-2)180° = (3)180° = 540°$

$x+7+5x+8+4x-17+5x+10+6x-14 = 540°$
$21x-6 = 540$
$21x = 546$
$x = 26$

7. Solve for the variables in the diagram.

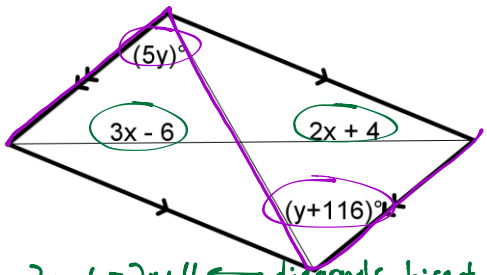
a.



$8y-11 = 4y+9$ ← (opp sides ≅ in a parallelogram)
$4y = 20$
$y = 5$

(consecutive ∠'s suppl.) → $5x-7+4x+16 = 180$
$9x+9 = 180$
$9x = 171$
$x = 19$

b.

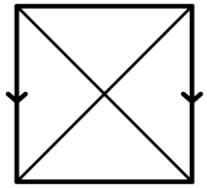


$3x-6 = 2x+4$ ← diagonals bisect in a parallelogram
$x = 10$

$5y = y+116$ ← alt. int ∠'s ≅
$4y = 116$
$y = 29$

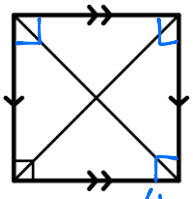
8. Determine the most specific classification that can be used for the given quadrilateral based only upon the markings.

a.



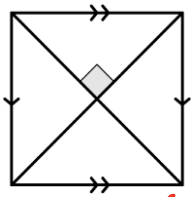
trapezoid (one pair of parallel sides)

b.



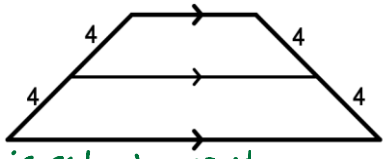
rectangle (because of the right angle and the parallel lines all the angles are right ∠'s)

c.



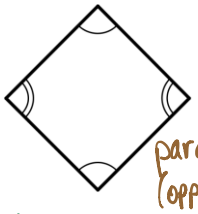
rhombus (opp sides ∥ makes it a parallelogram and the perpendicular diagonals make it a rhombus)

d.



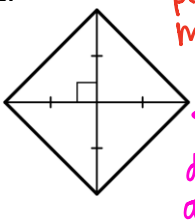
isosceles trapezoid (one pair of parallel sides, legs are congruent)

e.



parallelogram (opp angles are ≅)

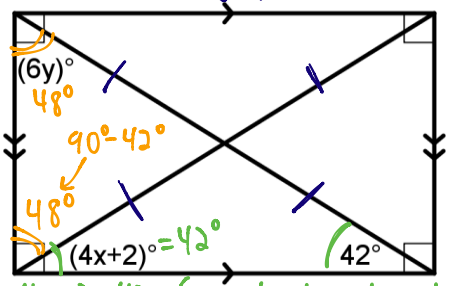
f.



square (perpendicular diagonals make it a rhombus and congruent diagonals make it a rectangle, so it is a square)

9. Solve for the variables in the diagrams.

a. rectangle, so diagonals bisect and are congruent



4x+2 = 42 ← (isosceles triangle makes base ∠'s ≅)

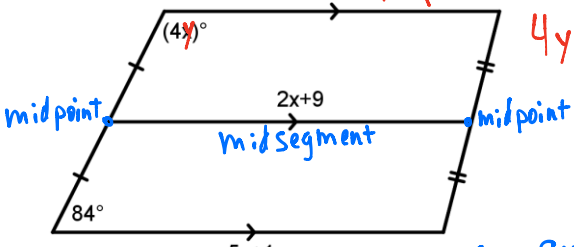
4x = 40

x = 10

48 = 6y

8 = y

b. trapezoid, so consecutive angles between the parallel lines are Suppl.



$4y + 84 = 180$

$4y = 96$

$y = 24$

$\text{midsegment} = \frac{b_1 + b_2}{2}$

$2x + 9 = \frac{4x-3 + 5x+1}{2}$

$\frac{2x+9}{1} = \frac{9x-2}{2}$

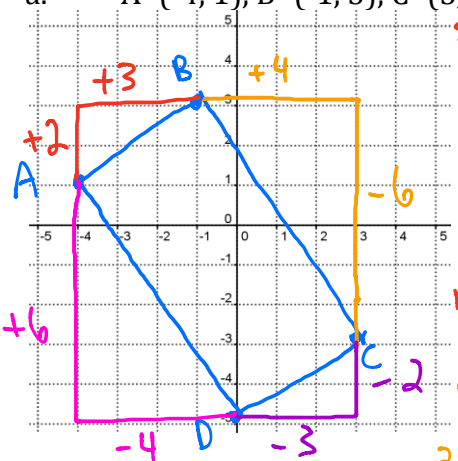
$4x + 18 = 9x - 2$

$20 = 5x$

$4 = x$

10. Graph the four points, then determine the most specific classification for the quadrilateral. Explain your reasoning.

a. A=(-4, 1), B=(-1, 3), C=(3, -3), D=(0,-5)



slope $\overline{AB} = \frac{2}{3}$

slope $\overline{BC} = \frac{-6}{4} = \frac{-3}{2}$

slope $\overline{CD} = \frac{-2}{-3} = \frac{2}{3}$

slope $\overline{AD} = \frac{6}{-4} = -\frac{3}{2}$

length $\overline{AB}$: $2^2 + 3^2 = c^2$, $4 + 9 = c^2$, $\sqrt{13} = c$

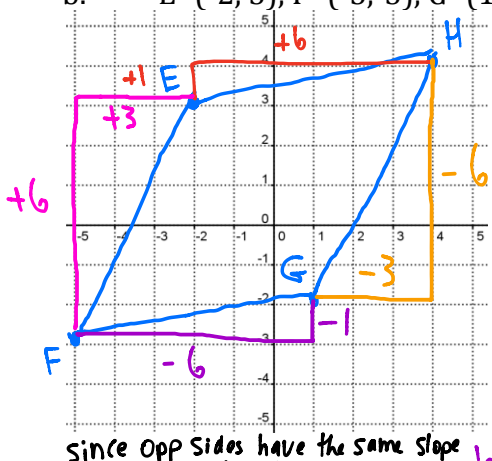
length $\overline{BC}$: $4^2 + (-6)^2 = c^2$, $16 + 36 = c^2$, $2\sqrt{13} = \sqrt{4 \cdot 13} = \sqrt{52} = c$

length $\overline{CD} = \sqrt{13}$

length $\overline{AD} = 2\sqrt{13}$

Since slopes are opposite reciprocals the angles are right angles so it is a rectangle. Since the sides are not all the same length it is not a rhombus nor a square. Thus it is a rectangle.

b. E=(-2, 3), F=(-5,-3), G=(1, -2), H=(4, 4)



slope $\overline{EH} = \frac{1}{6}$

slope $\overline{HG} = \frac{-6}{-3} = 2$

slope $\overline{FG} = \frac{-1}{6} = \frac{1}{6}$

slope $\overline{FE} = \frac{6}{3} = 2$

length $\overline{EH}$: $1^2 + 6^2 = c^2$, $1 + 36 = c^2$, $\sqrt{37} = c$

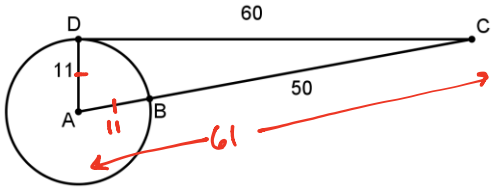
length $\overline{HG}$: $(-3)^2 + (-6)^2 = c^2$, $9 + 36 = c^2$, $3\sqrt{5} = \sqrt{9 \cdot 5} = \sqrt{45} = c$

length $\overline{FG} = \sqrt{37}$

length $\overline{FE} = 3\sqrt{5}$

Since opp sides have the same slope they are parallel making it a parallelogram. No slopes are opp. reciprocals so there are no right angles and it is not a rectangle or square. Since not all the sides are the same length it is not a rhombus. Thus it is a parallelogram.

11. Determine if $\overline{CD}$ is tangent to $\odot A$. Explain your reasoning.



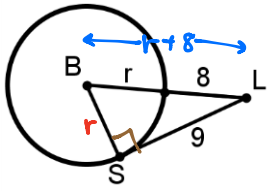
$61^2 \square 11^2+60^2$

$3721 \square 121+3600$

$3721 = 3721$

yes $\overline{CD}$ is tangent to $\odot A$ because $\angle D$ is a right angle

12. Determine the radius of $\odot B$ if $\overline{SL}$ is tangent.



$(r+8)^2 = r^2+9^2$

$(r+8)(r+8) = r^2+81$

$r^2+8r+8r+64 = r^2+81$

$r^2+16r+64 = r^2+81$

$-r^2 \quad -r^2$

$16r+64 = 81$

$-64 \quad -64$

$16r = 17$

$\frac{16r}{16} = \frac{17}{16}$

$r = \frac{17}{16} = 1.0625$

13. Determine the following measures of $\odot C$:

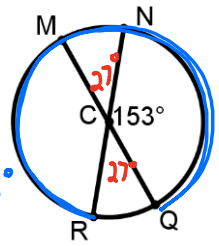
a. $m\widehat{RQ} =$ 27°

$180°-153°=27°$

b. $m\widehat{MNQ} =$ 180°

c. $m\widehat{RMQ} =$ 333°

$360°-27°=333°$

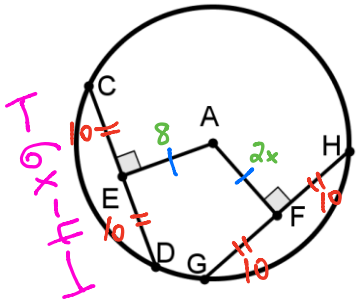


14. In $\odot A$ $\overline{CD} \cong \overline{HG}$, $FG = 10$, $AF = 2x$, $AE = 8$, and $CD = 6x - 4$. Use this information to find the following values:

a. $x =$ 4

b. $AF =$ 8

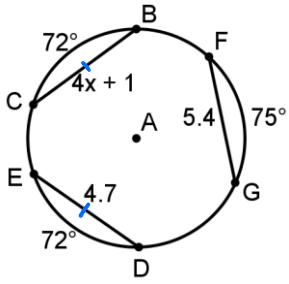
c. $HG =$ 20



$\frac{8}{2} = \frac{2x}{2}$

$4 = x$

15. Write an equation and solve for x. Explain your reasoning in setting up the equation.

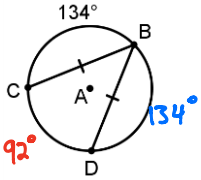


$4x+1 = 4.7$ ← because $m\widehat{CB} = m\widehat{ED} = 72°$ we know $\overline{CB} \cong \overline{ED}$

$4x = 3.7$

$x = 0.925$

16. Determine the following measures in $\odot A$: $m\widehat{BD} =$ 134° $m\widehat{CD} =$ 92°



$134° + 134° = 268°$

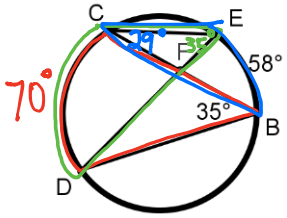
$360° - 268° = 92°$

For questions 17-20 find the measure of each angle or arc.

17. a. $m\angle ECB =$ 29° 58°÷2=29°

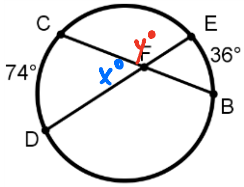
b. $m\angle CED =$ 35° 70°÷2=35°

c. $m\widehat{CD} =$ 70° 35°·2=70°



18. a. $m\angle CFD =$ 55°

b. $m\angle EFC =$ 125° 180°-55°=125°



angle = $\frac{\text{arc} + \text{arc}}{2}$

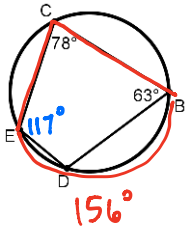
$x° = \frac{74° + 36°}{2}$

$x° = \frac{110°}{2}$

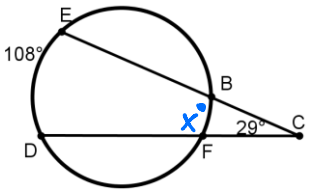
$x° = 55°$

19. a. $m\angle CED =$ 117° 180°-63°=117°

b. $m\widehat{EB} =$ 156° 78°·2=156°



20. $m\widehat{BF} =$ 50°



angle = $\frac{\text{big arc} - \text{small arc}}{2}$

$\frac{29°}{1} = \frac{108° - x°}{2}$

$58° = 108° - x°$

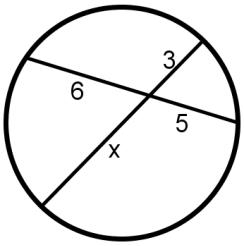
$-58° \quad -58°$

$0° = 50° - x°$

$+x° \quad +x°$

$x° = 50°$

21. Solve for x.

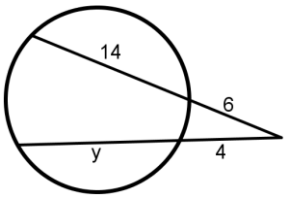


$3 \cdot x = 6 \cdot 5$

$\frac{3x}{3} = \frac{30}{3}$

$x = 10$

22. Solve for y.



outside(whole) = outside(whole)

$4(4+y) = 6(6+14)$

$16 + 4y = 6(20)$

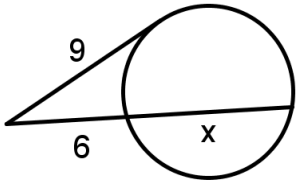
$16 + 4y = 120$

$-16 \quad -16$

$\frac{4y}{4} = \frac{104}{4}$

$y = 26$

23. Solve for x.



outside(whole) = outside(whole)

$6(6+x) = 9(9)$

$36 + 6x = 81$

$-36 \quad -36$

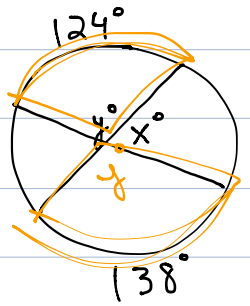
$\frac{6x}{6} = \frac{45}{6}$

$x = 7.5$

Warmup

Solve for all variables

1)



$\text{inside angle} = \frac{\text{arc} + \text{arc}}{2}$

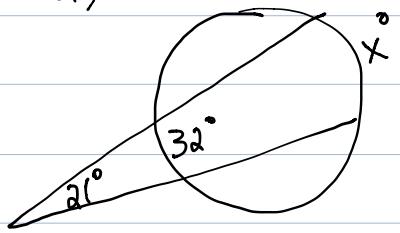
$y^\circ = \frac{124^\circ + 138^\circ}{2}$

$\boxed{y = 131}$

$x = 180 - 131$

$\boxed{x = 49}$

2)



$\text{outside angle} = \frac{\text{big arc} - \text{small arc}}{2}$

$\frac{21^\circ}{1} = \frac{x^\circ - 32^\circ}{2}$

$42^\circ = x^\circ - 32^\circ$

$+32^\circ \quad +32^\circ$

$\boxed{74 = x}$