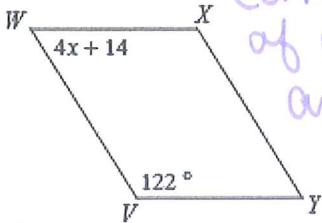


Unit 3 Polygons/Quadrilaterals Midterm Exam Re-Teach 2016

Name: Key

Directions: Solve for the missing angle or variable for the following PARALLELOGRAMS.

1. Find x.



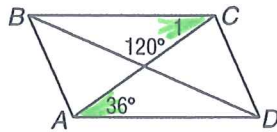
con. int \angle s of a para are suppl.

$$4x + 14 + 122 = 180$$

$$4x + 136 = 180$$

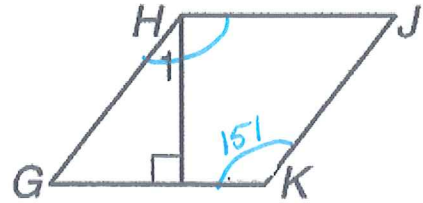
$$\boxed{x = 11}$$

2. Find $m < 1$.



alt int \angle s of a Para are \cong
 $\angle 1 = 36^\circ$

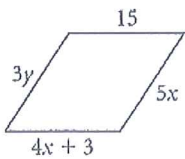
3. $m < JKG = 151^\circ$, find $m < 1$.



$$\angle 1 + 90^\circ = 151^\circ$$

$$\boxed{\angle 1 = 61^\circ}$$

4. Find x and y if the figure below is a parallelogram.



$4x + 3 = 15$ op. sides of a para are \cong

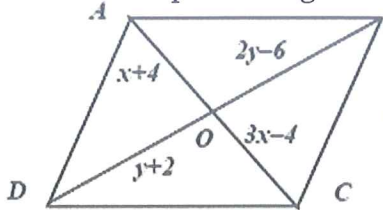
$$4x = 12$$

$$\boxed{x = 3}$$

$5(3) = 3y$ op. sides of a para are \cong

$$\boxed{5 = y}$$

5. ABCD is a parallelogram. Find x, y, BD and AC. Show your geometry and justifications.



$AO \cong CO$ diags of a para bisect each other

$$x + 4 = 3x - 4$$

$$8 = 2x$$

$$\boxed{4 = x}$$

$$BD = 2(8) - 6 + 8 + 2$$

$$\boxed{BD = 20}$$

$OB \cong OD$ diags of a para bisect each other

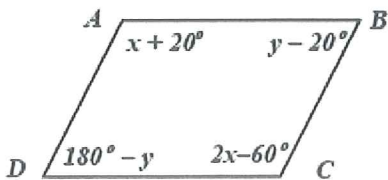
$$2y - 6 = y + 2$$

$$\boxed{8 = y}$$

$$AC = 4 + 4 + 3(4) - 4$$

$$\boxed{AC = 16}$$

6. ABCD is a parallelogram. Find x, y and $\angle C$. Show your geometry and justifications.



$\angle A \cong \angle C$ op. \angle s of a Para are \cong

$$x + 20 = 2x - 60$$

$$20 = x - 60$$

$$\boxed{80 = x}$$

$$m\angle C = 2(80) - 60$$

$\angle B \cong \angle D$ op. \angle s of a Para are \cong

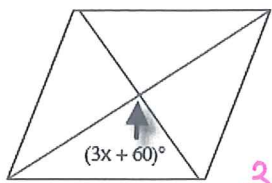
$$y - 20 = 180 - y$$

$$2y = 200$$

$$\boxed{y = 100}$$

$$\boxed{m\angle C = 100^\circ}$$

7. Find x if the figure below is a rhombus. Show your geometry and justifications.



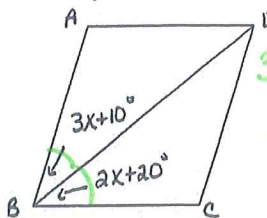
diags of a Rhombus are \perp to each other

$$3x + 60 = 90$$

$$3x = 30$$

$$\boxed{x = 10}$$

8. Find x , $m \angle ABD$, $m \angle ABC$, and $m \angle CDA$ if ABCD is a rhombus. Show your geometry and justifications.



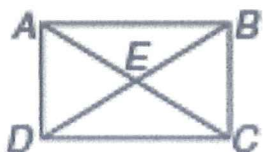
$\angle ABD \cong \angle CBD$ diags of a rhombus bisect the angles.
 $3x + 10 = 2x + 20$
 $x + 10 = 20$
 $\boxed{x = 10}$

$$\angle ABD = 3(10) + 10 \quad \boxed{m \angle ABD = 40^\circ}$$

$$\angle ABC = 3(10) + 10 + 2(10) + 20 \quad \boxed{\angle ABC = 40^\circ}$$

$$\angle CDA = \angle ABC \text{ op. } \angle \text{ s of a Rhombus are } \cong \quad \boxed{m \angle CDA = 40^\circ}$$

9. ABCD is a rectangle where $DE = 6x - 7$ and $AE = 4x + 9$. Find BD. Show your geometry and justifications.



Diags of a rect. are \cong

$$\frac{1}{2} DB = \frac{1}{2} AC \text{ multiplication}$$

$$DE = AE \text{ (diags of a rect. also bisect each other)}$$

$$6x - 7 = 4x + 9$$

$$2x - 7 = 9$$

$$2x = 16$$

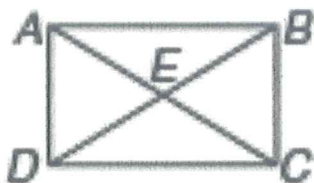
$$\boxed{x = 8}$$

$$BD = 2(DE)$$

$$BD = 2(6(8) - 7)$$

$$\boxed{BD = 82}$$

10. ABCD is a rectangle where $AE = 3x + 3$ and $EC = 5x - 15$. Find AC. Show your geometry and justifications.



$$AE \cong EC \text{ diags of a rect bisect each other}$$

$$3x + 3 = 5x - 15$$

$$3 = 2x - 15$$

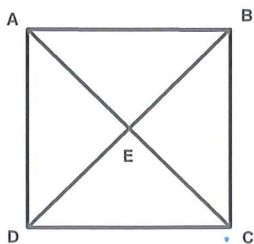
$$18 = 2x$$

$$\boxed{9 = x}$$

$$AC = 3(9) + 3 + 5(9) - 15$$

$$\boxed{AC = 60}$$

11. If ABCD is a square with $AC = 2p + 9$ and $BD = 3p - 6$, find p and BE. Show your geometry and justifications.



$AC \cong BD$ diags of a square are \cong

$$2p + 9 = 3p - 6$$

$$9 = p - 6$$

$$\boxed{15 = p}$$

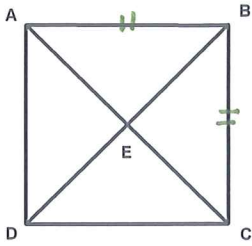
$$BE = \frac{1}{2} BD$$

(diags of a square bisect each other)

$$BE = \frac{1}{2} (3(15) - 6)$$

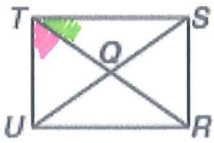
$$\boxed{BE = 19.5}$$

12. If ABCD is a square with $AB = 7x - 2$ and $BC = 4x + 3$, find x . Show your geometry and justifications.



$AB \cong BC$ def of a square
 (4 \cong sides and 4 right \angle s)
 $7x - 2 = 4x + 3$
 $3x - 2 = 3$
 $3x = 5$
 $x = \frac{5}{3}$

13. In rectangle RSTU, $m\angle STR = 8x + 3$ and $m\angle UTR = 16x - 9$. Find x and $m\angle STR$. Show your geometry and justifications.



$\angle STR + \angle UTR = 90^\circ$
 $8x + 3 + 16x - 9 = 90$
 $24x - 6 = 90$
 $24x = 96$
 $x = 4$

$\angle STR = 8(4) + 3$
 $\angle STR = 35^\circ$

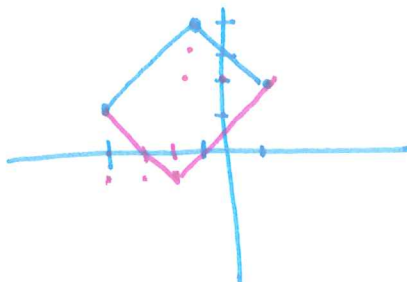
14. Given the set of vertices and the slopes and distances, classify polygon EFGH. Choose all that apply.

- I. Square II. Parallelogram III. Rectangle IV. Rhombus

| | |
|-----------------------------|-----------------|
| Slope $EF = 0$ | Distances |
| Slope $FG = \frac{1}{7}$ | $EF = 12$ Units |
| Slope $GH = 0$ | $FG = 12$ Units |
| Slope of $HE = \frac{1}{7}$ | $GH = 12$ Units |
| | $EH = 12$ Units |

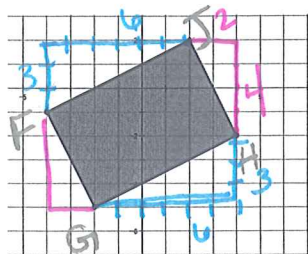
- a. I and IV only
 b. II and IV only
 c. I, II, III only
 d. I, II, III and IV

15. If ABCD is a rectangle with points $A(-4,1)$, $B(-1,4)$, $C(1,2)$, find the coordinates of D.



$D(-2, -1)$

16. Determine whether the figure with vertices $F(-4,-1)$, $G(-2,-5)$, $H(4,-2)$ and $J(2,2)$ is a parallelogram, rectangle, rhombus, and/or square.



$$\text{slope } FJ = \frac{3}{6} = \frac{1}{2}$$

$$\text{slope } GH = \frac{3}{6} = \frac{1}{2}$$

$$\text{slope } JH = -\frac{4}{2} = -2$$

$$\text{slope } FG = -\frac{4}{2} = -2$$

Distances

$$3^2 + 6^2 = FJ^2$$

$$9 + 36 = FJ^2$$

$$\sqrt{45} = FJ$$

$$(\sqrt{5})^2 (\sqrt{9}) \rightarrow 3$$

$$\boxed{FJ = 3\sqrt{5}}$$

$$3^2 + 6^2 = GH^2$$

$$9 + 36 = GH^2$$

$$\boxed{3\sqrt{5} = GH}$$

$$2^2 + 4^2 = FG^2$$

$$\sqrt{20} = FG$$

$$\boxed{2\sqrt{5} = FG}$$

$$2^2 + 4^2 = JH^2$$

$$4 + 16 = JH^2$$

$$\sqrt{20} = JH$$

$$(\sqrt{5})^2 (\sqrt{4}) \rightarrow 2$$

$$\boxed{JH = 2\sqrt{5}}$$

$FGHJ$ is a para because op. sides

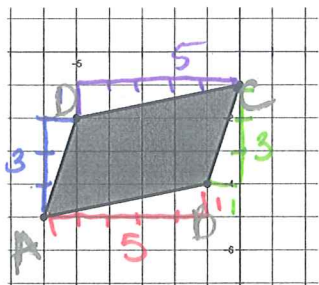
are parallel.

$FGHJ$ is a rectangle because it has \perp slopes (4 right \angle s)

$FGHJ$ is not a rhombus because it does not have 4 = sides

$FGHJ$ is not a square because it does not have 4 \cong sides (but it does have 4 right angles)

17. Determine whether the figure with vertices $A(-6,-5)$, $B(-1,-4)$, $C(0,-1)$, $D(-5,-2)$ is a parallelogram, rectangle, rhombus, and/or square.



$$\text{slope } AB = \frac{1}{5}$$

$$\text{slope } DC = \frac{1}{5}$$

$$\text{slope } BC = \frac{3}{1} = 3$$

$$\text{slope } AD = \frac{3}{1} = 3$$

$$1^2 + 5^2 = AB^2$$

$$1 + 25 = AB^2$$

$$\boxed{\sqrt{26} = AB}$$

$$1^2 + 5^2 = DC^2$$

$$\boxed{\sqrt{26} = DC}$$

$$1^2 + 3^2 = BC^2$$

$$1 + 9 = BC^2$$

$$\boxed{\sqrt{10} = BC}$$

$$1^2 + 3^2 = AD^2$$

$$1 + 9 = AD^2$$

$$\boxed{\sqrt{10} = AD}$$

$ABCD$ is a para because op sides are parallel.

$ABCD$ is not a rectangle because it does not have \perp slopes.

$ABCD$ is not a rhombus because it doesn't have 4 = sides.

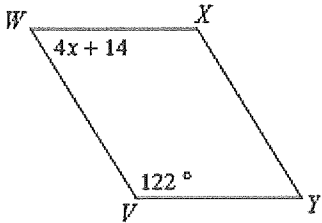
$ABCD$ is not a square because it doesn't have 4 right angles or 4 \cong sides.

Unit 3 Polygons/Quadrilaterals Midterm Exam Re-Teach 2016

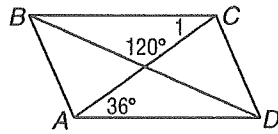
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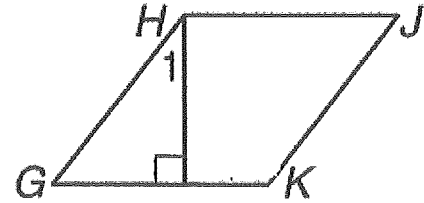
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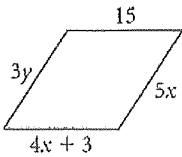
2. Find $m < 1$.



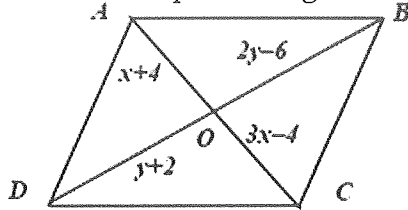
3. $m \angle JKG = 151^\circ$, find $m < 1$.



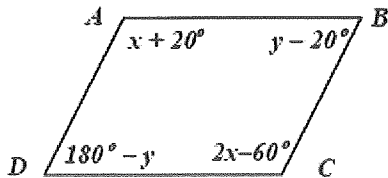
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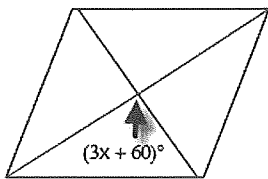
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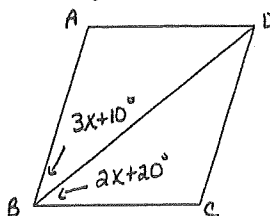
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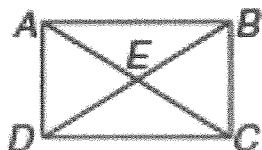
7. Find x if the figure below is a rhombus. Show your justifications.



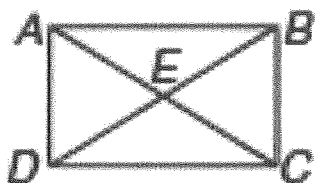
8. Find x , $m \angle ABD$, $m \angle ABC$, and $m \angle CDA$ if $ABCD$ is a rhombus. Show your geometry and justifications.



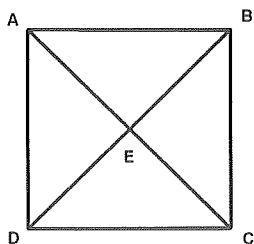
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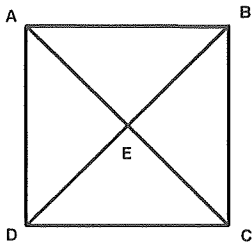
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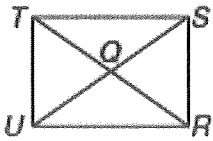
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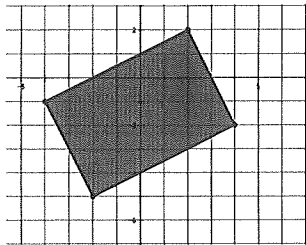
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