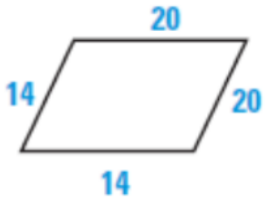
Name _____ Date _____ Period _____

Regular Parallelograms - Review

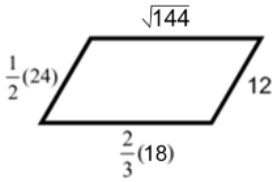
Level 1:

Determine whether or not the following figures are parallelograms. Give a reason for your answer.

1. 

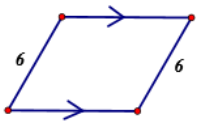
Parallelogram: Yes or (No)

Reason **Both pair of opposite sides not congruent**

2. 

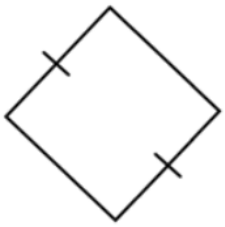
Parallelogram: (Yes) or No

Reason **Both pair of opposite sides are congruent (all are equal to 12)--so it's actuall a rhombus, too!**

3. 

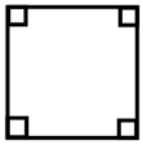
Parallelogram: Yes or (No)

Reason **One pair of opposite sides is marked parallel; The other pair of opposite sides is marked congruent--must be both congruent or both parallel**

4. 

Parallelogram: Yes or (No)

Reason **Missing information--Either the other pair of opposite sides must be congruent as well, or the congruent sides must also be parallel**

5. 

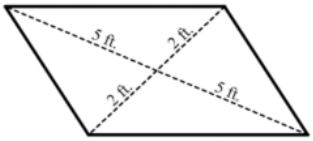
Parallelogram: (Yes) or No

Reason **Both pair of opposite angles are congruent--since all are 90^0, it's also a rectangle**

6. 

Parallelogram: Yes or No

Reason **Only one pair of opposite sides marked parallel; the other pair must also be parallel, or the parallel sides must also be congruent**

7. 

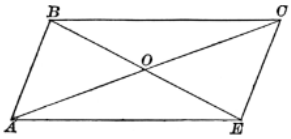
Parallelogram: Yes or No

Reason **The diagonals bisect each other**

8. 

Parallelogram: Yes or No

Reason **Both pair of opposite angles are congruent**

9. 

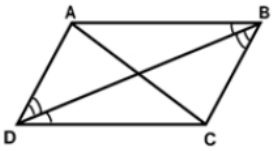
Parallelogram: Yes or No

Reason **No information given at all**

10. 

Parallelogram: Yes or No

Reason **The remaining angle must be 95⁰ (sum must be 360⁰)--which makes both pair of opposite angles congruent**

11. 

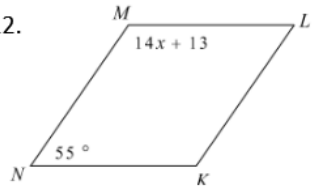
Parallelogram: Yes or No

Reason **Side *AB* is parallel to side *DC*, and side *AD* is parallel to side *BC* because alternate interior angles (for both side pairs) are marked congruent**

Level 2:

In problems 12 – 14, the figures are parallelograms.

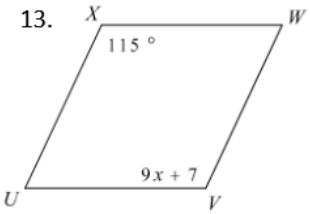
12.



$(14x + 13) + 55 = 180$
$14x + 68 = 180$
$14x = 112$
$x = 8$

x = 8

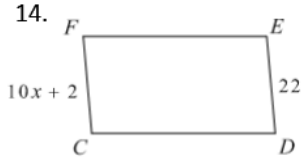
13.



$9x + 7 = 115$
$9x = 108$
$x = 12$

x = 12

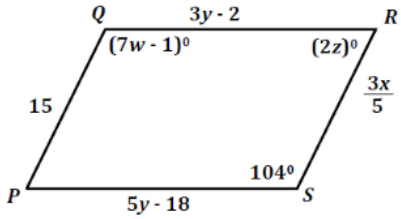
14.



$10x + 2 = 22$
$10x = 20$
$x = 2$

x = 2

15. *PQRS* is a parallelogram. Find all the variables.



$7w - 1 = 104$
$7w = 105$
$w = 15$

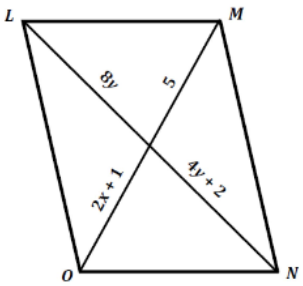
$2z = 76$
$z = 38$

$5y - 18 = 3y - 2$
$2y - 18 = -2$
$2y = 16$
$y = 8$

$3x/5 = 15$
$3x = 75$
$x = 25$

w = 15
x = 25
y = 8
z = 38

16. Solve for *x* and *y* in parallelogram *LMNO*.



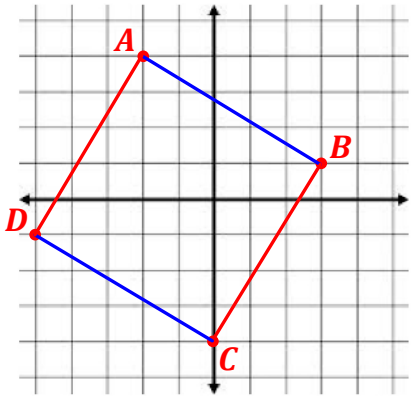
$4y + 2 = 8y$
$2 = 4y$
$1/2 = y$

$2x + 1 = 5$
$2x = 4$
$x = 2$

x = 2
y = 1/2

Level 3/4:

17. Graph quadrilateral ABCD with the given vertices: A(-2, 4), B(3, 1), C(0, -4), D(-5, -1).



a) Is the quadrilateral a parallelogram? Show why or why not and explain your work in complete sentences.

$m_{AD} = \frac{5}{3}$ $m_{AB} = -\frac{3}{5}$

$m_{BC} = \frac{5}{3}$ $m_{CD} = -\frac{3}{5}$

$\overline{AD} \parallel \overline{BC}$ (same slopes)
$\overline{AB} \parallel \overline{CD}$ (same slopes);
So, *ABCD* is a parallelogram because both pair of opposite sides are parallel

b) Is the quadrilateral a rhombus? Show why or why not and explain your work in complete sentences.

$AB = \sqrt{3^2 + 5^2} = \sqrt{9 + 25} = \sqrt{34}$

$BC = \sqrt{3^2 + 5^2} = \sqrt{34}$

$CD = \sqrt{3^2 + 5^2} = \sqrt{34}$

$DA = \sqrt{3^2 + 5^2} = \sqrt{34}$

ABCD is a rhombus; all 4 sides are congruent

c) Is the quadrilateral a rectangle? Show why or why not and explain your work in complete sentences.

$m_{AD} = \frac{5}{3}$ $m_{AB} = -\frac{3}{5}$

$m_{BC} = \frac{5}{3}$ $m_{CD} = -\frac{3}{5}$

$\overline{AD} \perp \overline{AB}$ and $\overline{BC} \perp \overline{CD}$ because they have opposite reciprocal slopes. So *ABCD* is a rectangle (all angles 90^0)

d) Is the quadrilateral a square? Show why or why not and explain your work in complete sentences.

Since *ABCD* is both a rectangle and a rhombus, it is a square :)