



Geometry Chapter 8 Test Review
 Quadrilaterals

Name KEY
 Period _____ A# _____

All work must be present in order to receive full credit.

True or False

- | | | |
|--|--|-----------------|
| 1. A rectangle has congruent diagonals. |  | 1. <u>TRUE</u> |
| 2. All squares are rectangles. | | 2. <u>TRUE</u> |
| 3. All rhombi are squares. | | 3. <u>FALSE</u> |
| 4. All rhombi are quadrilaterals. | | 4. <u>TRUE</u> |
| 5. All rectangles are quadrilaterals. | | 5. <u>TRUE</u> |
| 6. If the diagonals of a parallelogram bisect one another, then the parallelogram is a rectangle. | <i>could be a rhombus, square...</i> | 6. <u>FALSE</u> |
| 7. All parallelograms are rectangles. | | 7. <u>FALSE</u> |
| 8. If a quadrilateral has both pairs of opposite sides that are parallel and congruent, then the quadrilateral is a rectangle. | | 8. <u>FALSE</u> |
| 9. The diagonals of an isosceles trapezoid are congruent. |  | 9. <u>TRUE</u> |

Short Answer

10. Find the measure of **each interior angle** for a regular ¹⁰decagon. 10. 144

METHOD 1:

$$\begin{array}{r} 10 \text{ SIDES} \\ - 2 \\ \hline 8 \text{ TRIANGLES} \end{array}$$

$$\begin{array}{r} 180 \\ \times 8 \\ \hline 1440 \end{array} \text{ SUM OF INTERIOR } \angle \text{'S}$$

$$1440 \div 10 = \boxed{144} \text{ one interior } \angle$$

$$S = 180(n-2)$$

METHOD 2:

$$360 \div 10 = 36 \text{ one exterior } \angle$$



$$\begin{array}{r} 180 \\ - 36 \\ \hline 144 \end{array} \text{ one interior } \angle$$

11. Find the measure of **each exterior angle** for a regular ⁵pentagon. 11. 72

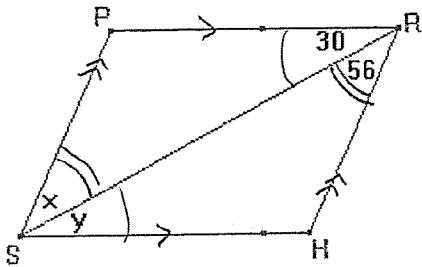
$$360 \div 5 = \boxed{72}$$

The sum of the measures of exterior angles for ANY polygon is 360.

12. Find x and y so that quadrilateral PRHS is a parallelogram.

12. $x = \underline{56}$

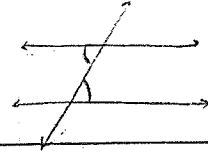
$y = \underline{30}$



$x = 56$

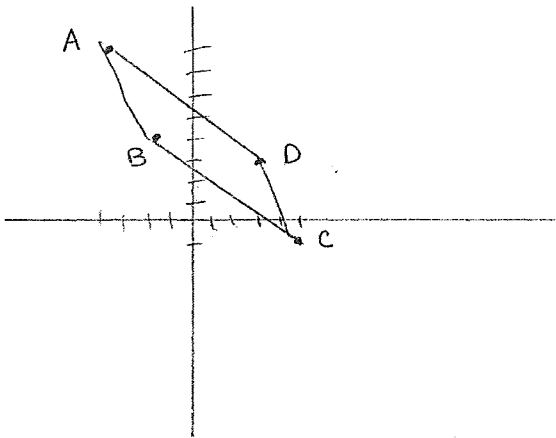
$y = 30$

If 2 lines are \parallel , then alternate interior angles are \cong .



13. Determine whether the figure with the given vertices is a parallelogram. Use the method indicated. Justify your answer. (Sketch the figure and LABEL your work.)

$A(-4, 8), B(-2, 4), C(5, -1), D(3, 3)$; Distance formula



$$\begin{aligned} AD &= \sqrt{(3 - (-4))^2 + (3 - 8)^2} \\ &= \sqrt{(7)^2 + (-5)^2} \\ &= \sqrt{49 + 25} \\ &= \sqrt{74} \end{aligned}$$

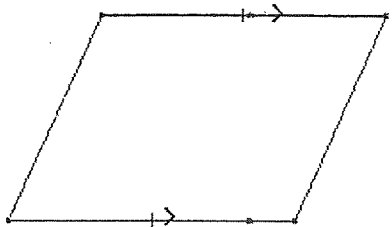
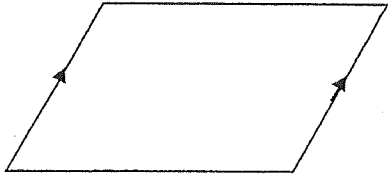
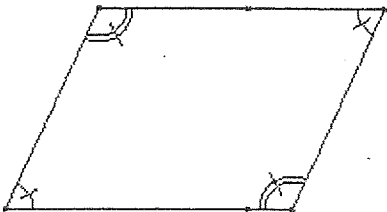
$$\begin{aligned} BC &= \sqrt{(5 - (-2))^2 + (-1 - 4)^2} \\ &= \sqrt{(7)^2 + (-5)^2} \\ &= \sqrt{49 + 25} \\ &= \sqrt{74} \end{aligned}$$

$$\begin{aligned} AB &= \sqrt{(-2 - (-4))^2 + (4 - 8)^2} \\ &= \sqrt{(2)^2 + (-4)^2} \\ &= \sqrt{4 + 16} \\ &= \sqrt{20} \end{aligned}$$

$$\begin{aligned} DC &= \sqrt{(3 - 5)^2 + (3 - (-1))^2} \\ &= \sqrt{(-2)^2 + (4)^2} \\ &= \sqrt{4 + 16} \\ &= \sqrt{20} \end{aligned}$$

Yes, the figure is a parallelogram because both pairs of opposite sides are congruent.

#14-16. Determine whether the quadrilateral is a parallelogram. Justify your answer.

<p>14.</p> 	<p>14. YES, IT IS A \square. ONE PAIR OF OPPOSITE SIDES IS BOTH PARALLEL AND CONGRUENT.</p>
<p>15.</p> 	<p>15. NOT ENOUGH INFORMATION TO DETERMINE.</p>
<p>16.</p> 	<p>16. YES, IT IS A \square. BOTH PAIRS OF OPPOSITE ANGLES ARE CONGRUENT.</p>

#17-21. Use parallelogram MNPQ to answer the following:

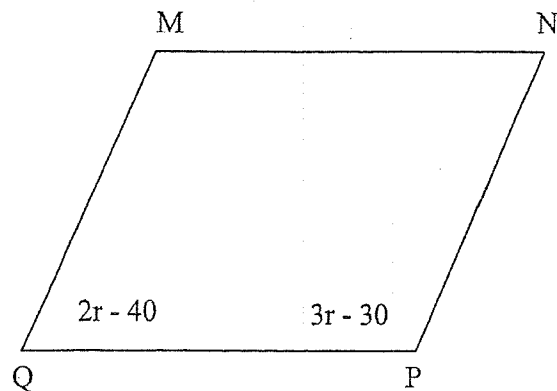
17. $\overline{MN} \cong \overline{QP}$

18. $\overline{NP} \parallel \overline{MQ}$

19. $r = 50$

20. $m\angle Q = 60^\circ$

21. $m\angle P = 120^\circ$



$$2r - 40 + 3r - 30 = 180$$

$$5r - 70 = 180$$

$$5r = 250$$

$$r = 50$$

$$m\angle Q = 2(50) - 40$$

$$= 100 - 40$$

$$= 60$$

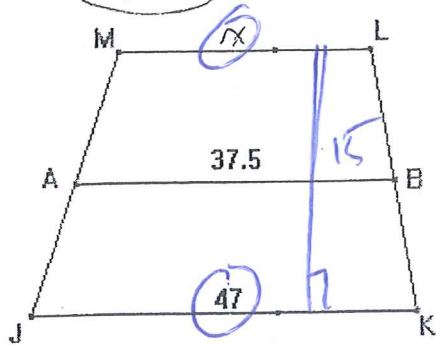
$$m\angle P = 3(50) - 30$$

$$= 150 - 30$$

$$= 120$$

Supplementary!

22. For trapezoid JKLM, A and B are midpoints of the legs. Find ML. 22. 28



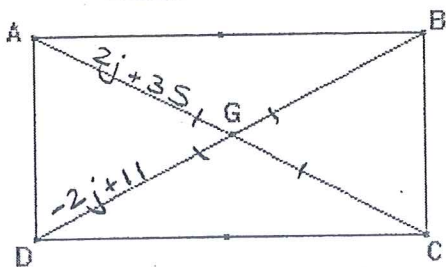
$$2 \left(\frac{47 + x}{2} = 37.5 \right)$$

$$47 + x = 75$$

$$x = 28$$

$$A = 15 \cdot 37.5$$

23. In rectangle ABCD, $AG = 2j + 35$ and $DG = -2j + 11$. Find BD. 23. 46



$$\begin{array}{r} 2j + 35 = -2j + 11 \\ +2j \quad \quad +2j \\ \hline 4j + 35 = 11 \end{array}$$

$$\begin{array}{r} 4j + 35 = 11 \\ -35 \quad -35 \\ \hline 4j = -24 \end{array}$$

$$j = -6$$

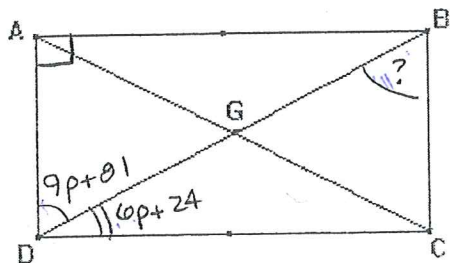
$$j = -6$$

$$BD = [-2(-6) + 11] \cdot 2$$

$$(12 + 11) \cdot 2$$

$$(23) \cdot 2 = 46$$

24. In rectangle ABCD, if $m\angle ADB = 9p + 81$ and $m\angle CDB = 6p + 24$, find $m\angle CBD$.



24. 72

$$9p + 81 + 6p + 24 = 90$$

$$\begin{array}{r} 15p + 105 = 90 \\ -105 \quad -105 \\ \hline 15p = -15 \end{array}$$

$$\frac{15p}{15} = \frac{-15}{15} \quad p = -1$$

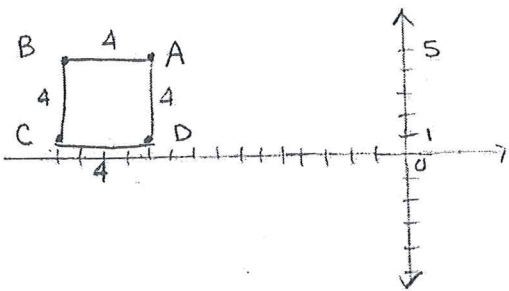
$$m\angle CBD = 9(-1) + 81$$

$$= -9 + 81$$

$$= 72$$

30. Determine whether the figure with the given vertices is a parallelogram. Justify your answer.
(Sketch the figure and LABEL your work.)

A(-11,5), B(-15,5), C(-15,1), D(-11,1)



$$m \text{ of } \overline{AB} = \frac{5-5}{-15+11} = \frac{0}{-4} = 0$$

$$m \text{ of } \overline{CD} = \frac{1-1}{-11+15} = \frac{0}{4} = 0$$

$$m \text{ of } \overline{BC} = \frac{1-5}{-15+15} = \frac{-4}{0} = \text{UNDEFINED SLOPE}$$

$$m \text{ of } \overline{AD} = \frac{1-5}{-11+11} = \frac{-4}{0} = \text{UNDEFINED SLOPE}$$

$$AB = \sqrt{(-15+11)^2 + (5-5)^2} = \sqrt{(-4)^2 + (0)^2} = \sqrt{16} = 4$$

$$BC = \sqrt{(-15+15)^2 + (1-5)^2} = \sqrt{(0)^2 + (-4)^2} = \sqrt{16} = 4$$

$$CD = \sqrt{(-11+15)^2 + (1-1)^2} = \sqrt{(4)^2 + (0)^2} = \sqrt{16} = 4$$

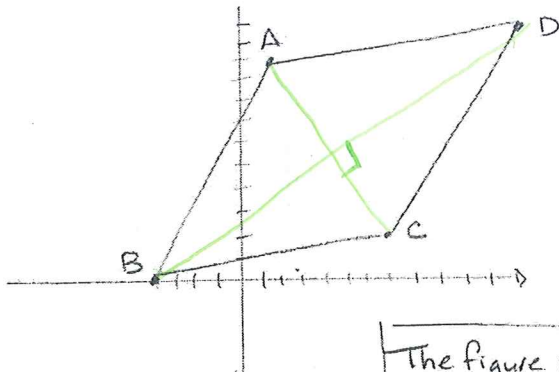
$$AD = \sqrt{(-11+11)^2 + (1-5)^2} = \sqrt{(0)^2 + (-4)^2} = \sqrt{16} = 4$$

Yes, the figure is a \square because:

- both pairs of opposite sides are parallel -OR-
- both pairs of opposite sides are congruent -OR-
- one pair of opposite sides is both parallel and congruent.

31. Determine whether the figure with the given vertices is a rectangle, rhombus, and/or square. List all that apply. Justify your answer. (Sketch the figure and LABEL your work.)

A(1,10), B(-4,0), C(7,2), D(12,12)



$$m \text{ of } \overline{AD} = \frac{12-10}{12-1} = \frac{2}{11}$$

$$m \text{ of } \overline{BC} = \frac{2-0}{7+4} = \frac{2}{11}$$

$$m \text{ of } \overline{AB} = \frac{0-10}{-4-1} = \frac{-10}{-5} = 2$$

$$m \text{ of } \overline{DC} = \frac{12-2}{12-7} = \frac{10}{5} = 2$$

$$AB = \sqrt{(-4-1)^2 + (0-10)^2} = \sqrt{(-5)^2 + (-10)^2} = \sqrt{25+100} = \sqrt{125}$$

$$DC = \sqrt{(12-7)^2 + (12-2)^2} = \sqrt{(5)^2 + (10)^2} = \sqrt{25+100} = \sqrt{125}$$

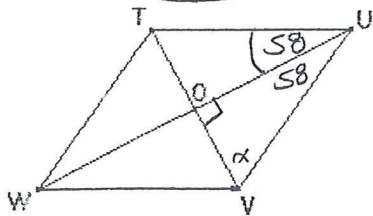
The figure is a rhombus because all sides are \cong and angles are not right angles.

$$AD = \sqrt{(12-1)^2 + (12-10)^2} = \sqrt{(11)^2 + (2)^2} = \sqrt{121+4} = \sqrt{125}$$

$$BC = \sqrt{(7+4)^2 + (2-0)^2} = \sqrt{(11)^2 + (2)^2} = \sqrt{121+4} = \sqrt{125}$$

25. In rhombus $TUVW$, if $m\angle TUW = 58$, find $m\angle UVT$.

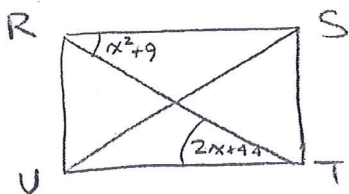
25. 32



$$\begin{aligned}
 90 + 58 + x &= 180 \\
 148 + x &= 180 \\
 -148 & \quad -148 \\
 \hline
 x &= 32
 \end{aligned}$$

26. $RSTU$ is a rectangle. If $m\angle SRT = x^2 + 9$ and $m\angle UTR = 2x + 44$, find $m\angle SRT$. (Sketch the figure)

26. 58 OR 34



$$\begin{aligned}
 2(7) + 44 & & 2(-5) + 44 \\
 14 + 44 & & -10 + 44 \\
 58 \checkmark & & 34 \checkmark
 \end{aligned}$$

$$x^2 + 9 = 2x + 44$$

$$x^2 - 2x - 35 = 0$$

$$(x - 7)(x + 5)$$

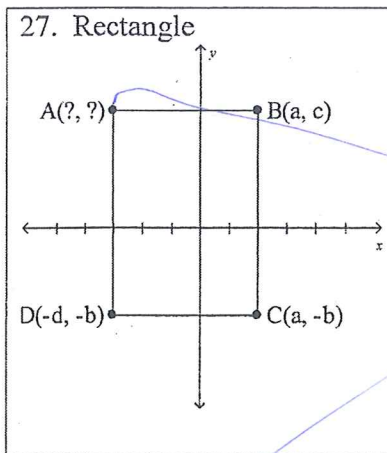
$$\begin{aligned}
 \downarrow \\
 x - 7 &= 0 \\
 x &= 7
 \end{aligned}$$

$$\begin{aligned}
 \downarrow \\
 x + 5 &= 0 \\
 x &= -5
 \end{aligned}$$

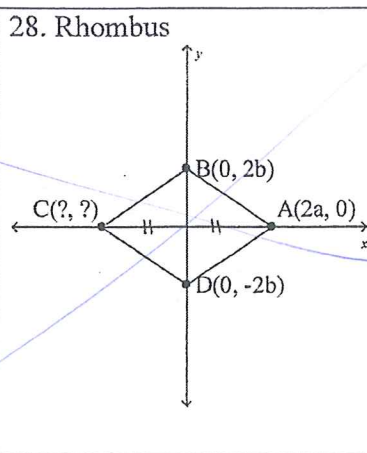
$$\begin{array}{r}
 -35 \\
 -7 \times 5 \\
 \hline
 -2
 \end{array}$$

$$\begin{aligned}
 m\angle SRT &= (7)^2 + 9 & \text{OR} & & (-5)^2 + 9 \\
 &= 49 + 9 & & & 25 + 9 \\
 &= \boxed{58} \checkmark & & & \boxed{34} \checkmark
 \end{aligned}$$

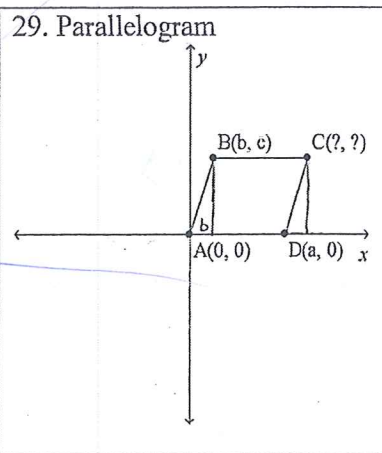
#27-29. Name the missing coordinates in terms of the given variables.



$$\boxed{A(-d, c)}$$



$$\boxed{C(-2a, 0)}$$



$$\boxed{C(a+b, c)}$$

32. Quadrilateral Properties Checklist. Check all that apply.

	Parallel- ogram	Rectangle	Rhombus	Square	Isosceles Trapezoid
Both pairs of opposite sides are parallel	✓	✓	✓	✓	
Both pairs of opposite sides are congruent	✓	✓	✓	✓	
Exactly one pair of opposite sides is parallel					✓
All sides are congruent			✓	✓	
Exactly one pair of opposite sides is congruent					✓
Opposite angles are congruent	✓	✓	✓	✓	
All angles are right angles		✓		✓	
Diagonals are perpendicular ✕			✓	✓	
Diagonals bisect the opposite angles			✓	✓	
Diagonals are congruent ✕		✓		✓	✓
Diagonals bisect each other	✓	✓	✓	✓	
Consecutive angles are supplementary	✓	✓	✓	✓	