

Geometry Honors Review for 8.4 and 8.5

Decide if the following statements are true or false. If the statement is false, cross out a word and change it to make it a true statement.

- The diagonals of a rhombus bisect each other. True
- The diagonals of a ~~parallelogram~~ are congruent. square or rectangle
- A rhombus is a ~~square~~. Parallelogram
- A square is a rectangle. True
- The consecutive angles of a rectangle are ~~congruent~~. supplementary
- The ~~consecutive~~ angles of a rhombus are congruent. opposite
- ~~Adjacent~~ sides of a rectangle are congruent. opposite
- The diagonals of a rectangle are ~~perpendicular~~. congruent
- The diagonals of a ~~rectangle~~ bisect opposite angles. Rhombus
- A ~~rectangle~~ is equilateral. square
- BOXE** is a rhombus. If $SB = 4$ in. and $ES = 6$ in. find the perimeter of **BOXE** in simplest radical form.

$$4^2 + 6^2 = EB^2$$

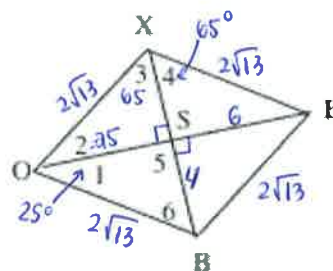
$$16 + 36 = EB^2$$

$$52 = EB^2$$

$$EB = \sqrt{52} = 2\sqrt{13}$$

$$P = 4(2\sqrt{13})$$

$$P = 8\sqrt{13} \text{ in}$$



12. Using the same figure above, if $m\angle 1 = 25^\circ$, find the measures of:
 a) $\angle 2 = 25^\circ$ b) $\angle 3 = 65^\circ$ c) $\angle 4 = 65^\circ$ d) $\angle 5 = 90^\circ$

13. Using the same figure above, if $m\angle 1 = 3x + 1^\circ$ and $m\angle 3 = 7x - 11^\circ$ find the value of x .

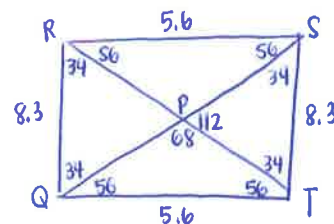
$$3x + 1 + 7x - 11 = 90$$

$$10x - 10 = 90$$

$$10x = 100$$

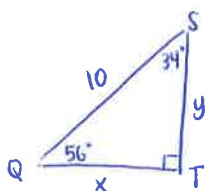
$$x = 10$$

14. Draw rectangle **QRST** with diagonals intersecting at Point **P**.



If $m\angle PTS = 34^\circ$ and $QS = 10$, find the following measures to the nearest tenth:

- a) $m\angle SRT = 56^\circ$ b) $QP = 5$ c) $QR = 8.3$ d) $m\angle QPR = 112^\circ$ e) $RP = 5$ f) $RS = 5.6$



$$\frac{\sin 34^\circ}{1} = \frac{x}{10}$$

$$x = 10 \sin 34^\circ$$

$$x = 5.6$$

$$\frac{\cos 34^\circ}{1} = \frac{y}{10}$$

$$y = 10 \cos 34^\circ$$

$$y = 8.3$$

15. Draw square **BENT** with diagonals intersecting at point L.

$$x^2 + 4x = 45$$

$$x^2 + 4x - 45 = 0$$

$$(x+9)(x-5) = 0$$

$$x = -9, x = 5$$

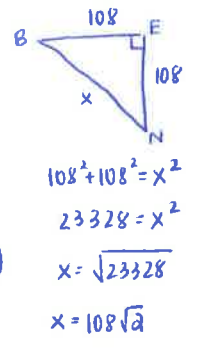
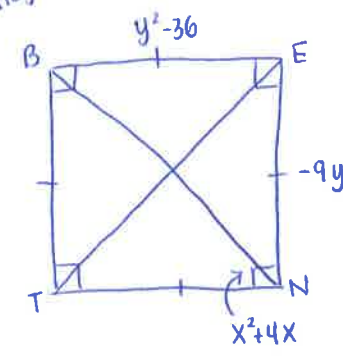
$$y^2 - 36 = -9y$$

$$y^2 + 9y - 36 = 0$$

$$(y+12)(y-3) = 0$$

$$y = -12, y = 3$$

not a solution since $-9(3) = -27$ and you can't have neg. side lengths



If $BE = y^2 - 36$, $EN = -9y$ and $m\angle BNT = (x^2 + 4x)^\circ$, find x, y and ET .

since $BN = 108\sqrt{2}$ and diagonals are \cong , then $ET = 108\sqrt{2}$

16. Draw parallelogram **ABCD** with the diagonals intersecting at point E. $AB = 4x + y$, $AD = 2x + y$, $m\angle BAD = (3y^2 + 41)^\circ$, $BC = 6$ and $DC = 8$. Is **ABCD** a rectangle? Why or why not?

$$2x + y = 6$$

$$4x + y = 8$$

$$y = 6 - 2x$$

$$y = 8 - 4x$$

$$m\angle A = 3(4)^2 + 41$$

$$m\angle A = 89^\circ$$

$$6 - 2x = 8 - 4x$$

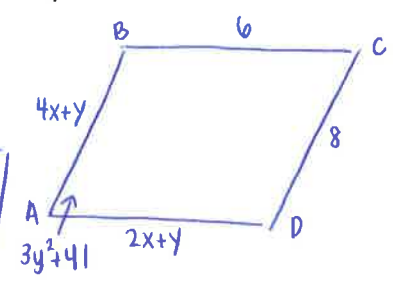
$$y = 8 - 4(1)$$

$$y = 4$$

$$2x = 2$$

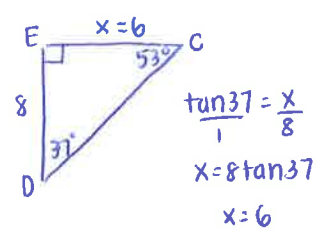
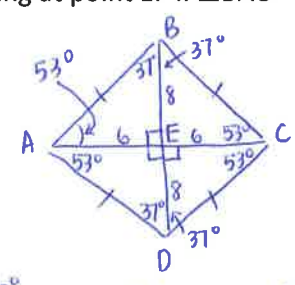
$$x = 1$$

not a rectangle b/c $m\angle A \neq 90^\circ$



17. Draw rhombus **ABCD** with the diagonals intersecting at point E. If $\angle BAC = 53^\circ$ and $DE = 8$ find the following:

* diagonals bisect angles and opp angles are \cong



- a) $m\angle DAC = 53^\circ$ b) $m\angle ADC = 74^\circ$ c) $m\angle AED = 90^\circ$ d) $DB = 16$ e) $AC = 12$ f) $AE = 6$

18. **WXYZ** is a trapezoid with bases WZ and XY and midsegment MN . If $MN = 10x + 3$, $WZ = 11$, and $XY = 8x + 19$, find the length of the midsegment.

$$10x + 3 = \frac{1}{2}(11 + 8x + 19)$$

$$10x + 3 = \frac{1}{2}(8x + 30)$$

$$10x + 3 = 4x + 15$$

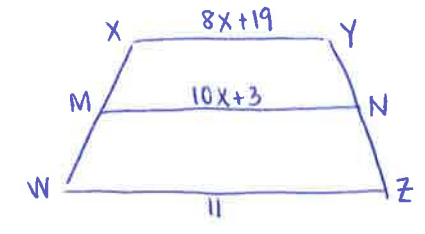
$$6x + 3 = 15$$

$$6x = 12$$

$$x = 2$$

$$MN = 10(2) + 3$$

$$MN = 23$$



19. In trapezoid **FGHI**, $\overline{FG} \parallel \overline{IH}$, J is the midpoint of \overline{FI} and K is the midpoint of \overline{GH} . If $JK = 7$, $FG = x^2 + 2$, and $IH = x^2 + 2x - 12$, find the value(s) of x .

$$7 = \frac{1}{2}(x^2 + 2 + x^2 + 2x - 12)$$

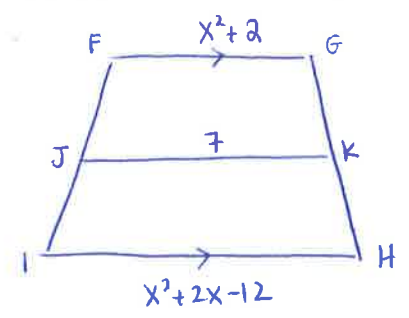
$$7 = \frac{1}{2}(2x^2 + 2x - 10)$$

$$7 = x^2 + x - 5$$

$$0 = x^2 + x - 12$$

$$(x+4)(x-3) = 0$$

$x = -4, x = 3$
not a solution since $(-4)^2 + 2(-4) - 12 = -4$ and there can't be negative side lengths



20. Isosceles Trapezoid TRAP has legs of length 10 and midsegment \overline{MN} . $TR = 12$ and the perimeter of TRNM is 37. Please find the perimeter of NAPM.

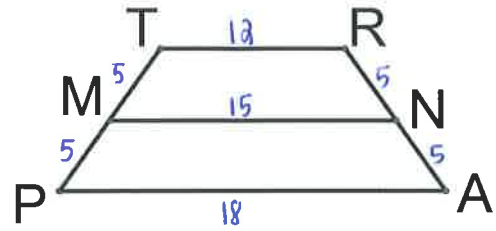
$$MN = 37 - 12 - 5 - 5$$

$$MN = 15$$

$$15 = \frac{1}{2}(12 + PA)$$

$$30 = 12 + PA$$

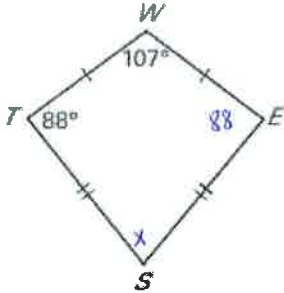
$$PA = 18$$



$$P \text{ of } NAPM = 5 + 15 + 5 + 18$$

$$P = 43$$

21. WEST is a kite. Find the missing angle measures.



$$m\angle E = 88^\circ$$

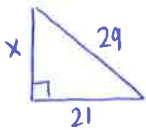
$$x + 88 + 88 + 107 = 360$$

$$x + 283 = 360$$

$$x = 77$$

$$m\angle S = 77^\circ$$

22. The longer diagonal of a rhombus measures 42 cm. One side of the rhombus measures 29 cm. Find the length of the shorter diagonal.



$$21^2 + x^2 = 29^2$$

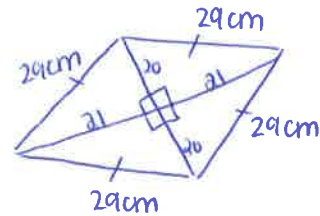
$$441 + x^2 = 841$$

$$x^2 = 400$$

$$x = 20$$

$$\text{diagonal} = 20 + 20$$

$$= 40 \text{ cm}$$



23. Find the side lengths of the kite below. Please leave in simplest radical form.

$$11^2 + 6^2 = PQ^2$$

$$157 = PQ^2$$

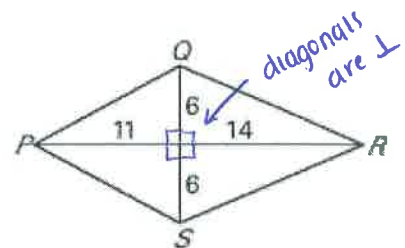
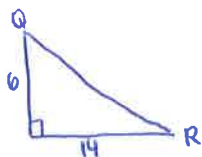
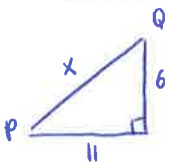
$$PQ = \sqrt{157}$$

$$6^2 + 14^2 = QR^2$$

$$232 = QR^2$$

$$QR = \sqrt{232}$$

$$QR = 2\sqrt{58}$$



24. Graph the following points. Give the most specific name for the quadrilateral. Include complete explanation including work. Find BD and AC. What additional information do these lengths provide about the quadrilateral?

A(-1,5), B(2,5), C(6, 1) and D(-3, 1)

$$\begin{aligned} \text{Slope of } \overline{AB} &= \frac{5-5}{2-(-1)} = \frac{0}{3} = 0 \\ \text{Slope of } \overline{DC} &= \frac{1-1}{6-(-3)} = \frac{0}{9} = 0 \end{aligned} \quad \left. \vphantom{\begin{aligned} \text{Slope of } \overline{AB} \\ \text{Slope of } \overline{DC} \end{aligned}} \right\} \overline{AB} \parallel \overline{DC}$$

ABCD is a trapezoid since the bases are parallel

$$BD = \sqrt{(-3-2)^2 + (1-5)^2} = \sqrt{(-5)^2 + (-4)^2} = \sqrt{25+16} = \sqrt{41}$$

$$AC = \sqrt{(-1-6)^2 + (5-1)^2} = \sqrt{(-7)^2 + (4)^2} = \sqrt{49+16} = \sqrt{65}$$

Since diagonals are not congruent, the trapezoid is not isosceles

