

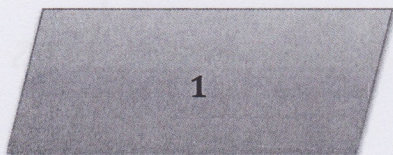
Name: Answer Key

Date: \_\_\_\_\_

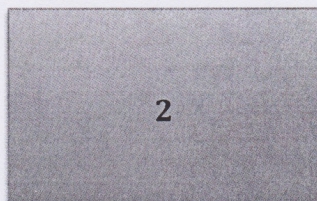
### Post-Test on Quadrilaterals (100 points)

**Matching:** For problems 1-10, match the number of each shape to the correct properties. You may use each number **more than once**. Also, you **can use multiple numbers for each property** because some properties apply to more than one shape. Each problem in this section is worth 2 points each.

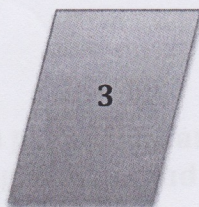
**Parallelogram**



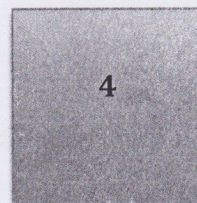
**Rectangle**



**Rhombus**



**Square**

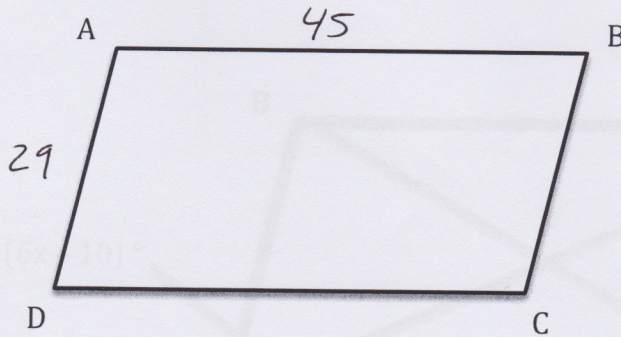


1. 1,2,3,4 Opposite sides are congruent.
2. 1,2,3,4 Opposite sides are parallel.
3. 1,2,3,4 Opposite angles are congruent.
4. 1,2,3,4 Consecutive angles are supplementary.
5. 1,2,3,4 Diagonals bisect each other.
6. 2,4 Four right angles.
7. 2,4 Diagonals are congruent.
8. 3,4 Four congruent sides.
9. 3,4 Diagonals are perpendicular.
10. 3,4 Diagonals bisect opposite angles.



**Directions:** For problems 11-21, there are various quadrilaterals with given lengths and angles. Solve for the lengths and angles for which you are asked. Keep in mind that these figures are **NOT** necessarily drawn to scale. If a length or an angle that you are solving for is not a whole number, round to the nearest tenth. This assignment will not be graded, but it will be used to plan out future lessons on this topic. **Please show your work.**

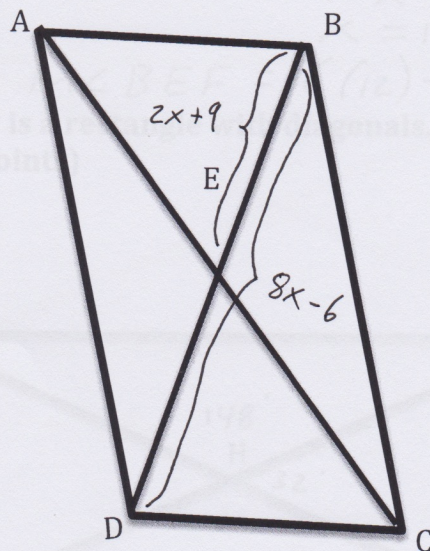
11. The figure below is a parallelogram. If  $AB = 45$  and  $AD = 29$ , what are the length values for  $BC$  and  $DC$ ? (4 points)



$$BC = \underline{29}$$

$$DC = \underline{45}$$

12. The figure below is a parallelogram with diagonals. If  $BD = 8x-6$  and  $BE = 2x+9$ , what is the length of  $BD$  and  $BE$ ? (6 points)



$$8x-6 = 2(2x+9)$$

$$8x-6 = 4x+18$$

$$4x = 24$$

$$x = 6$$

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

$$= 48-6$$

$$= 42$$

$$BE = 2(6)+9$$

$$= 21$$

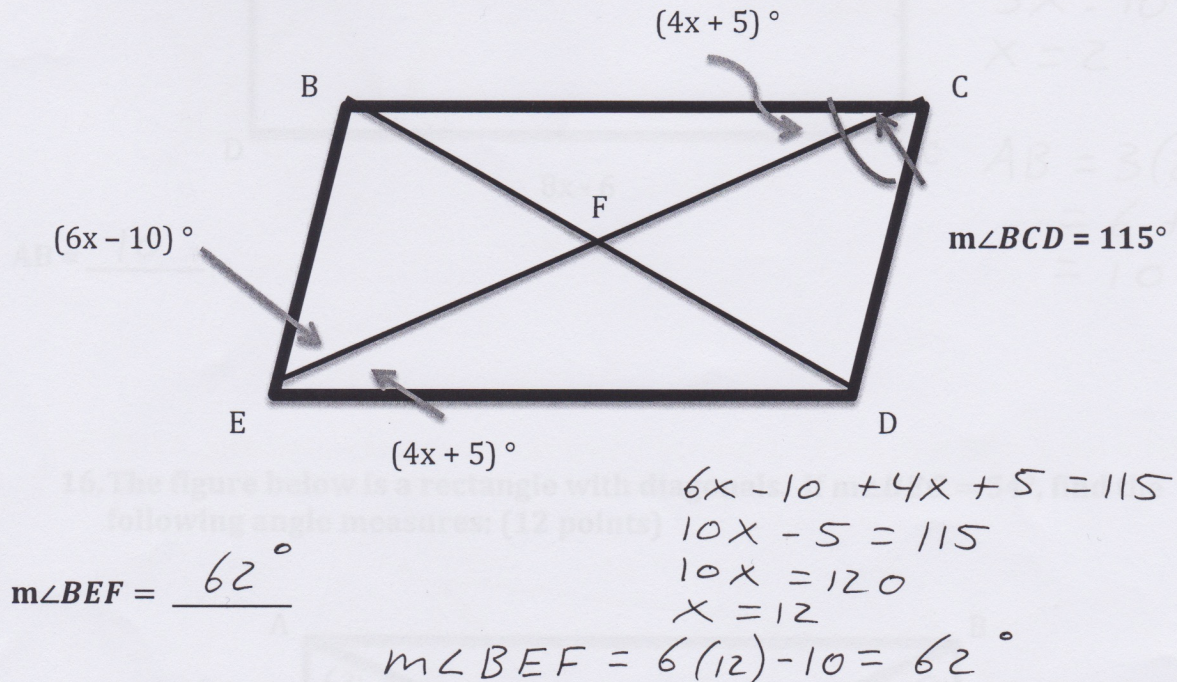
$$BD = \underline{42}$$

$$BE = \underline{21}$$

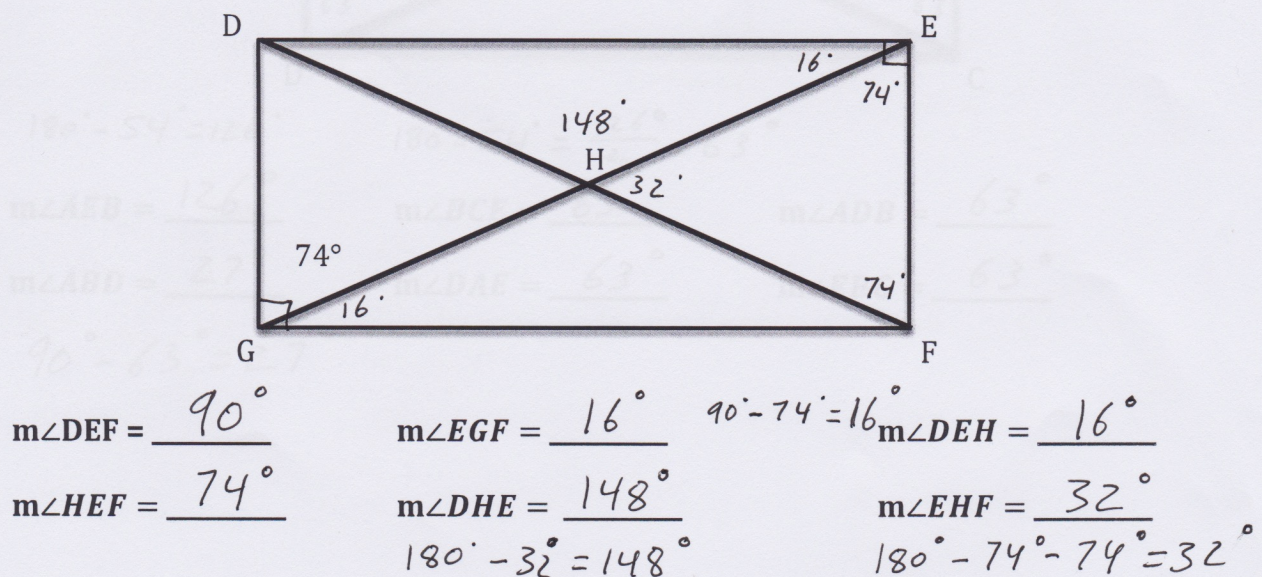


13. The following figure is a parallelogram with diagonals. Given the following information, what is the  $m\angle BEF$ ? (6 points)

- $m\angle BCF = (4x + 5)^\circ$
- $m\angle BEF = (6x - 10)^\circ$
- $m\angle DEF = (4x + 5)^\circ$
- $m\angle BCD = 115^\circ$

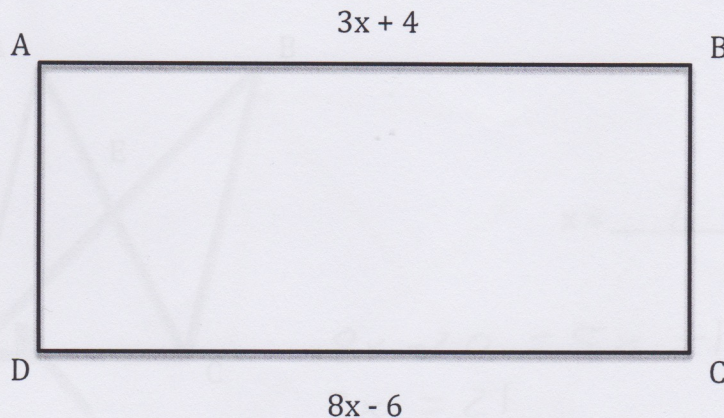


14. The figure below is a rectangle with diagonals. What are the following angle measures? (12 points)





15. The figure below is a rectangle. Given that length  $AB = 3x + 4$  and length  $DC = 8x - 6$ , what is the numerical length of  $AB$ ? (4 points)

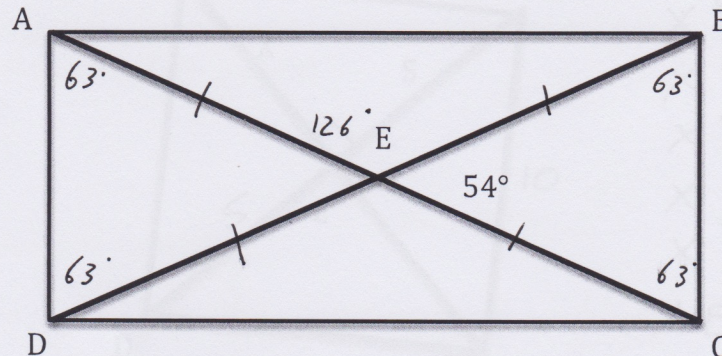


$$\begin{aligned} 3x + 4 &= 8x - 6 \\ 5x - 6 &= 4 \\ 5x &= 10 \\ x &= 2 \end{aligned}$$

$$\begin{aligned} AB &= 3(2) + 4 \\ &= 6 + 4 \\ &= 10 \end{aligned}$$

$AB = \underline{10}$

16. The figure below is a rectangle with diagonals. If  $m\angle BEC = 54^\circ$ , find the following angle measures: (12 points)



$$180^\circ - 54^\circ = 126^\circ$$

$$m\angle AEB = \underline{126^\circ}$$

$$m\angle ABD = \underline{27^\circ}$$

$$90^\circ - 63^\circ = 27^\circ$$

$$180^\circ - 54^\circ = \frac{126^\circ}{2} = 63^\circ$$

$$m\angle BCE = \underline{63^\circ}$$

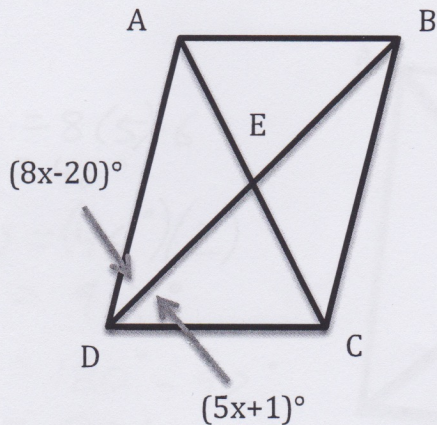
$$m\angle DAE = \underline{63^\circ}$$

$$m\angle ADB = \underline{63^\circ}$$

$$m\angle EBC = \underline{63^\circ}$$



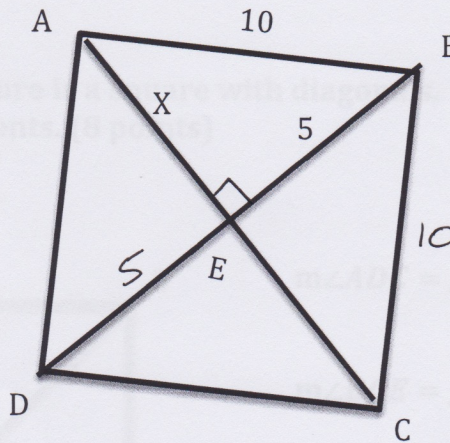
17. The figure below is a rhombus with diagonals. If  $m\angle ADE = (8x-20)^\circ$  and the  $m\angle CDE = (5x+1)^\circ$ , what is the value of  $x$ ? (4 points)



$$x = \underline{7}$$

$$\begin{aligned} 8x - 20 &= 5x + 1 \\ 3x &= 21 \\ x &= 7 \end{aligned}$$

18. The figure below is a rhombus with diagonals. Given that  $AE = X$ ,  $AB = 10$ , and  $BE = 5$ , what is the value of the following lengths? (8 points)



$$\begin{aligned} X^2 + 5^2 &= 10^2 \\ X^2 &= 100 - 25 \\ X^2 &= 75 \\ X &= 8.66 \\ X &= 8.7 \\ AE &= 8.7 \\ BD &= 5 + 5 = 10 \end{aligned}$$

$$BC = \underline{10}$$

$$DE = \underline{5}$$

$$AE = \underline{8.7}$$

$$BD = \underline{10}$$



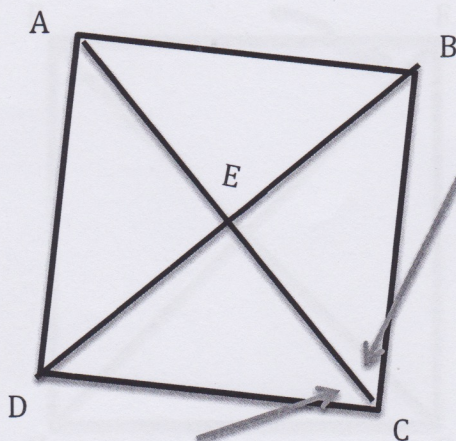
19. The figure below is a rhombus with diagonals. Given that  $m\angle BCE = (8x + 6)^\circ$  and  $m\angle DCE = (12x - 14)^\circ$ , what is the  $m\angle ADC$ ? (6 points)

OR:

$$m\angle BCE = 8(5) + 6 \\ = 46^\circ$$

$$m\angle BCD = (46^\circ)(2) \\ = 92^\circ$$

$$m\angle ADC = 180^\circ - 92^\circ \\ = 88^\circ$$



$$(12x - 14)^\circ \\ 46^\circ$$

$$12x - 14 = 8x + 6$$

$$4x - 14 = 6$$

$$4x = 20$$

$$x = 5$$

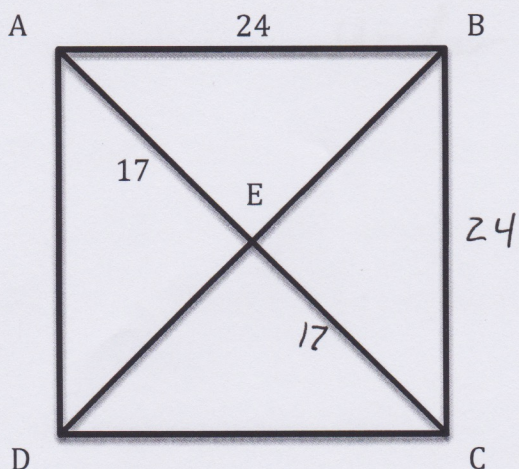
$$(8x + 6)^\circ$$

$$46^\circ m\angle BCE = 8(5) + 6 \\ = 46^\circ$$

$$m\angle ADC = 180^\circ - 46^\circ - 46^\circ \\ = 88^\circ$$

$$m\angle ADC = \underline{88^\circ}$$

20. The following figure is a square with diagonals. Find the following lengths and angle measurements. (8 points)



$$m\angle ADC = \underline{90^\circ}$$

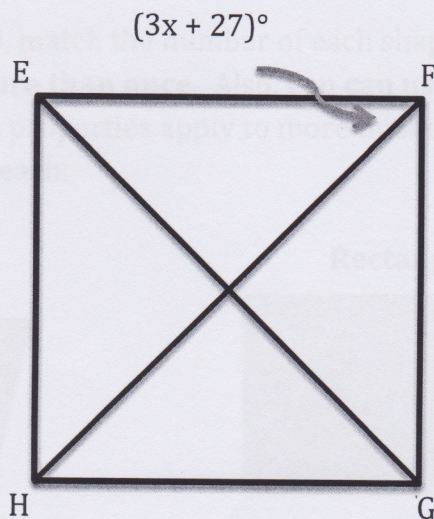
$$m\angle BCE = \underline{45^\circ}$$

$$CE = \underline{17}$$

$$BC = \underline{24}$$



21. The following figure is a square with diagonals. Solve for  $x$ . (4 points)



$$\begin{aligned} 2(3x + 27) &= 90 \\ 6x + 54 &= 90 \\ 6x &= 36 \\ x &= 6 \end{aligned}$$

$x = \underline{6}$

22. Short Answer: Choose two of the four quadrilaterals that we discussed during this unit (parallelogram, rectangle, rhombus, square), and give me **TWO** real-world examples **FOR EACH** shape. Please write in sentence form. (6 points)

1-2 points for listing 1-2 quadrilaterals

1-4 points: one for each example listed under two different quadrilaterals

1. 1, 2, 3, 4 Consecutive angles are supplementary.

2. 1, 2, 3, 4 Diagonals bisect each other.

3. 2, 4 Four right angles.

4. 2, 4 Diagonals are congruent.

5. 3, 4 Four congruent sides.

6. 3, 4 Diagonals are perpendicular.

7. 3, 4 Diagonals bisect opposite angles.