**Honors Math 3 – Parallelogram Worksheet**

***Complete the table:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Parallelogram | Rhombus | Rectangle | Square |
| 1. The diagonals are perpendicular. |  |  |  |  |
| 2. The figure has four right angles. |  |  |  |  |
| 3. The opposite sides are congruent. |  |  |  |  |
| 4. The diagonals are congruent. |  |  |  |  |
| 5. The figure has four congruent sides. |  |  |  |  |
| 6. The diagonals bisect each other. |  |  |  |  |
| 7. The consecutive angles are supplementary. |  |  |  |  |
| 8. Each diagonal bisects a pair of opposite angles. |  |  |  |  |
| 9. The figure has exactly four lines of symmetry. |  |  |  |  |
| 10. The figure is a rectangle. |  |  |  |  |

11. Draw a Venn diagram that shows the relationship between parallelograms, rhombi, squares, and rectangles.

***Determine whether the statements are always, sometimes, or never true.***

\_\_\_\_\_12. The diagonals of a rectangle are perpendicular. \_\_\_\_\_16. A square is a rectangle.

\_\_\_\_\_13. Consecutive sides of a rhombus are congruent. \_\_\_\_\_17. A rhombus is a square.

\_\_\_\_\_14. A parallelogram has at least one right angle. \_\_\_\_\_18. A rectangle is a parallelogram.

\_\_\_\_\_15. The diagonals of a parallelogram are congruent. \_\_\_\_\_19. A rectangle is a rhombus.

***What value of x and y will make the polygon a parallelogram?***

x-5

6x

y

72

x + 2

6

y - 1

3x

19. 20. 21.

(x+3y)°

2x°

(3x+5)°

70°

D

C

A

B

E

***Quadrilateral ABCD is a rhombus.***

22. $If m∡BAE=32°, find m∡ECD.$

23. $If m∡ECD=43°, find m∡CBA.$

24. $If m∡BED=3x-15°, find x.$

25. $If m∡EAB=57°, find m∡ADC.$

26. $If m∡BAD=4x+14° and m∡ABC=2x+10°, find m∡BCD.$

***Determine if PQRS is a parallelogram. Then determine whether it is a rectangle, rhombus, square or none of the above. Justify your answer.***

27. P (-2, 3) Q (-2, -4) R (2, -4) S (2, 3) 28. P (7, -1) Q (3, 6) R (-1, -1) S (-4, 6)

29. P (0, 5) Q (4, 3) R (5, 1) S (1, 3) 30. P (1, 1) Q (-2, 4) R (-5, 1) S (-2, -2)

***HIJK is a rectangle. For the value of x and the length of each diagonal.***

K

H

I

J

31. HJ = 3x + 7 and IK = 6x – 11

32. HJ = 19 + 2x and IK = 3x + 22

D

A

B

C

***ABCD is a rectangle. The diagonals intersect at E. Find x and y.***

33. $ m∡BCD=18x-3y, AB=x-2, CD=2y+14$

34. $ m∡ABD=3x-1, m∡EDC=2y+6,$

$$m∡ADB=4x+y, m∡DBC=x+8$$

D

C

A

B

E

***Given rhombus ABCD whose diagonals intersect at E.***

35. AB = 7x2 + 28, AC = x2 + 29x. Find AC.

36. $m∡BCA=2x^{2}-18x, m∡DBC=3x+36, $

$ find m∡BDC$

***Find the length or angle measure.***

37. WXYZ is a square. WX = 1 – 10x, YZ = 14 + 3x, find XY.

38. WXYZ is a rhombus. $m∡X=24\left(10-x\right)°, m∡Z=6\left(x+15\right)°, find m∡Y$

39. WXYZ is a rectangle. The perimeter of ∆XYZ = 24. XY + YZ = 5x – 1. XZ = 13 – x. Find WY.