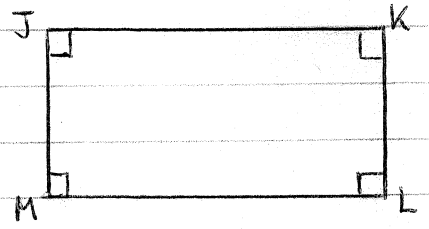
Geometry Ch 8-6 Exer., pg 546 # 14-16, 18-20, 21-24

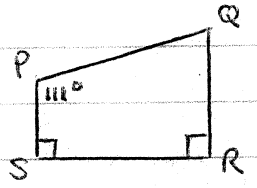
Give the most specific name for the quadrilateral.

14.



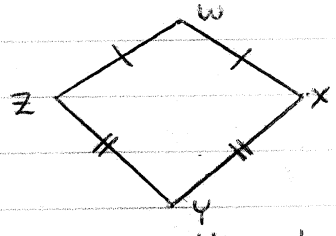
JKLM is a parallelogram because its opposite angles are congruent. However, it could more specifically named a Rectangle because all angles are congruent

15.



PQRS is a Trapezoid because of a single pair of parallel sides [PS ∥ QR]

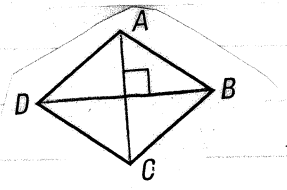
16.



WXYZ is a kite because of its two pair of consecutive congruent sides.

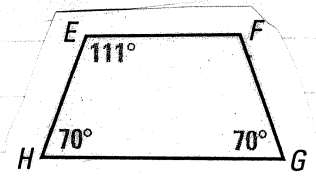
Tell whether enough info is given in the diagram to classify the quadrilateral by the given name.

18. Rhombus



No; ⊥ diagonals could also classify a quad. as a square or a kite.

19. Isos. Trapezoid

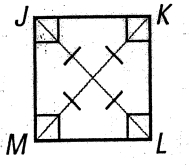


$111 + \angle F + 70 + 70 = 360$

$\angle F = 109$

No, $\angle F$ must equal $\angle E$ for an Isos. Trapezoid.

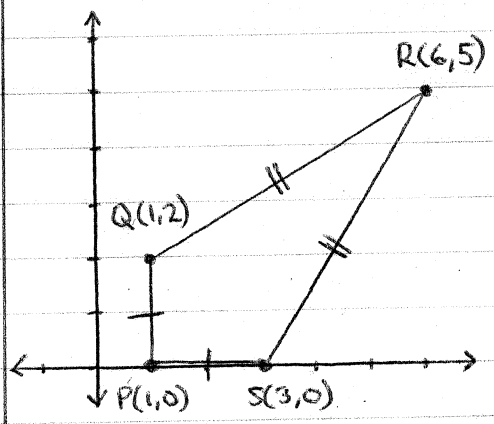
20. Square



No; while drawn like a square, 90° vertices and congruent diagonals could be a Rectangle

P, Q, R, S are vertices of a quadrilateral. Give/Justify the most specific name for PQRS.

21. P(1,0), Q(1,2), R(6,5), S(3,0)

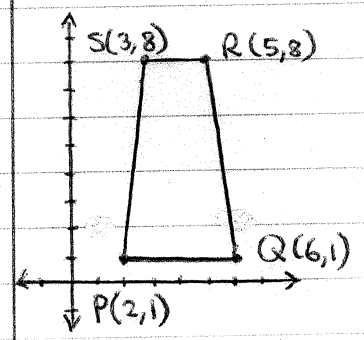


$$\begin{cases} PQ = 2 \\ PS = 2 \end{cases}$$

$$\begin{cases} QR = \sqrt{(6-1)^2 + (5-2)^2} = \sqrt{25+9} = \sqrt{34} \\ RS = \sqrt{(6-3)^2 + (5-0)^2} = \sqrt{9+25} = \sqrt{34} \end{cases}$$

Because of two pair of consecutive congruent sides, PQRS is a kite.

22. P(2,1), Q(6,1), R(5,8), S(3,8)



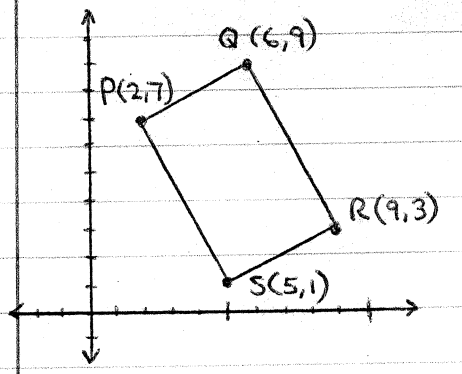
SR and PQ are horizontal, and thus parallel lines.
PS and QR are not parallel.
PQRS must be a Trapezoid.

However...

$$PR = \sqrt{(5-2)^2 + (8-1)^2} = \sqrt{9+49} = \sqrt{58}$$
$$SQ = \sqrt{(6-3)^2 + (1-8)^2} = \sqrt{9+49} = \sqrt{58}$$

Since the diagonals are congruent, PQRS is an Isosceles Trapezoid.

23. P(2,7), Q(6,9), R(9,3), S(5,1)



Diagonal Slopes:

$QS = \frac{9-1}{6-5} = \frac{8}{1}$

$PR = \frac{7-3}{2-9} = \frac{4}{7}$

NOT Perpendicular

Diagonal Lengths:

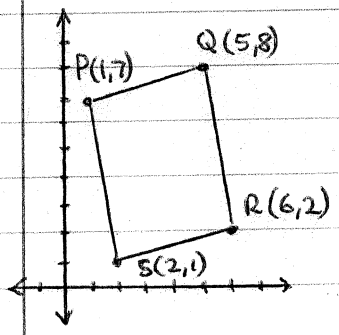
$QS = \sqrt{(6-5)^2+(9-1)^2} = \sqrt{1+64} = \sqrt{65}$

$PR = \sqrt{(2-9)^2+(7-3)^2} = \sqrt{49+16} = \sqrt{65}$

Congruent

PQRS must be a Rectangle

24. P(1,7), Q(5,8), R(6,2), S(2,1)



Diagonal Slopes:

$QS = \frac{8-1}{5-2} = \frac{7}{3}$

$PR = \frac{7-2}{1-6} = -\frac{5}{5} = -1$

NOT Perpendicular

Diagonal Lengths:

$QS = \sqrt{(5-2)^2+(8-1)^2} = \sqrt{9+49} = \sqrt{58}$

$PR = \sqrt{(1-6)^2+(7-2)^2} = \sqrt{25+25} = \sqrt{50}$

NOT Congruent

PQRS must be a Parallelogrem.

Diagonal MidPoints:

mid-pt $QS = \left(\frac{5+2}{2}, \frac{8+1}{2}\right) = \left(\frac{7}{2}, \frac{9}{2}\right)$

mid-pt $PR = \left(\frac{1+6}{2}, \frac{7+2}{2}\right) = \left(\frac{7}{2}, \frac{9}{2}\right)$

Common mid-point