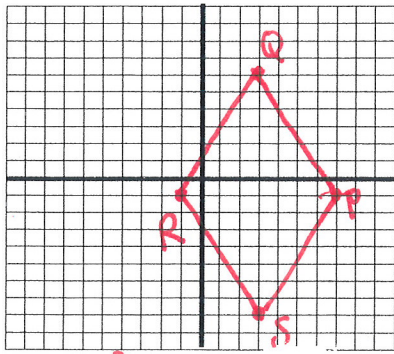Decide whether PQRS is a rectangle, rhombus, square, trapezoid, kite, or parallelogram. The picture is not enough information to determine your answer. You must show proof below your picture.
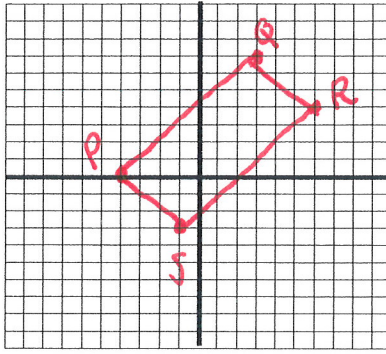
18. P(7,-1) Q(3,6) R(-1,-1) S(3,-8)

19. P(-4,0) Q(3,7) R(6,4) S(-1,-3)

20. P(1,1) Q(-2,4) R(-5,1) S(-2,-2)

18.
$mRQ = \frac{7}{4}$
$mQP = -\frac{7}{4}$
$mPS = \frac{7}{4}$
$mRS = -\frac{7}{4}$

□ b/c opp sides PS are ∥

$RQ = \sqrt{4^2+7^2} = \sqrt{65}$
$QP = \sqrt{4^2+7^2} = \sqrt{65}$
$PS = \sqrt{4^2+7^2} = \sqrt{65}$
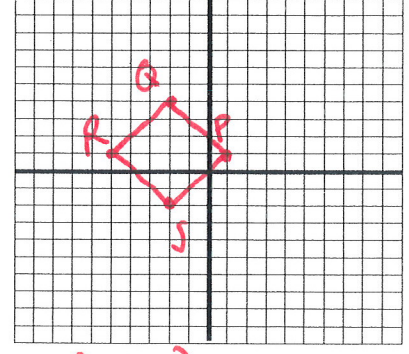$SR = \sqrt{4^2+7^2} = \sqrt{65}$

Rhombus b/c all sides are ≅

RHOMBUS

19.
$mPQ = \frac{7}{7} = 1$
$mQR = -\frac{3}{3} = -1$
$mRS = \frac{7}{7} = 1$
$mPS = -\frac{3}{3} = -1$

Opp sides are ∥ & consec sides are supp.

RECTANGLE — □ w/ 4 rt. ∡s

20.
$mRQ = \frac{3}{3} = 1$
$mQP = -\frac{3}{3} = -1$
$mPS = 1$
$mRS = -1$
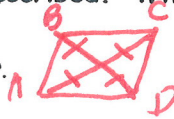
Rectangle

$mQS = \varnothing$
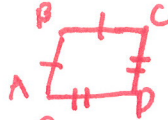$mRP = 0$ ⊥

SQUARE — Rect. w/ ⊥ diag.

Draw the sides and/or diagonals of ABCD as described. What type of quadrilateral is ABCD?

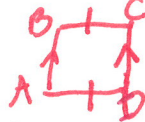21. $\overline{AC} \cong \overline{BD}$ and $\overline{AC}$ and $\overline{BD}$ bisect one another. **Rectangle**

22. $\overline{AB} \cong \overline{BC}$ and $\overline{CD} \cong \overline{DA}$, but $\overline{BC} \neq \overline{CD}$. **Kite**

23. $\overline{AB} \parallel \overline{CD}$ and $\overline{BC} \cong \overline{DA}$ **Isosceles Trapezoid**

24. $\overline{AC} \perp \overline{BD}$, $\overline{AC}$ and $\overline{BD}$ bisect one another, and $\overline{AC} \neq \overline{BD}$. **Rhombus**

25. $\overline{AC} \perp \overline{BD}$, $\overline{AC}$ and $\overline{BD}$ bisect one another, and $\overline{AC} \cong \overline{BD}$. **Square**

Determine whether the statement is always, sometimes, or never true.

26. Diagonals of a trapezoid are congruent — **Sometimes (Isos)**

27. Opposite sides of a rectangle are congruent. — **Always**

28. A square is a rectangle. — **Always**

29. A square is not a rhombus. — **Never**

30. All angles of a parallelogram are congruent. — **Sometimes (Rect & Sq)**

31. Opposite angles of an isosceles trapezoid are congruent. — **Never**

32. The diagonals of a parallelogram are perpendicular. — **Sometimes (Rhomb & Sq.)**