Geo Homework

1. A(0, 2), B(2, 4), C(4, 2), D(2, 0):
   - The slopes of AB and CD are both 1, and the slopes of BC and AD are both -1. This implies that the opposite sides are parallel, making it a parallelogram.
   - The lengths of AB and BC are equal, making it a rhombus.
2. D(-2, 1), E(-1, 3), F(3, 1), G(2, -1):
   - The slopes of DE and FG are both 0.5, and the slopes of EF and GD are both -0.5. This implies that the opposite sides are parallel, making it a parallelogram.
   - The lengths of DE and FG are equal, making it a rhombus.
3. A(-2, -1), B(0, 2), C(2, -1), D(0, -4):
   - The slopes of AB and CD are both -1.5, and the slopes of BC and AD are both 1.5. This implies that the opposite sides are parallel, making it a parallelogram.
   - The lengths of AB and BC are equal, making it a rhombus.
4. A(-3, 0), B(-1, 3), C(5, -1), D(3, -4):
   - The slopes of AB and CD are both -0.5, and the slopes of BC and AD are both 0.5. This implies that the opposite sides are parallel, making it a parallelogram.
   - The lengths of AB and BC are not necessarily equal, so it's not a rhombus.
5. S(-1, 4), T(3, 2), U(1, -2), V(-3, 0):
   - The slopes of ST and UV are both -0.5, and the slopes of TU and SV are both 2. This implies that the opposite sides are parallel, making it a parallelogram.
   - The lengths of ST and UV are not necessarily equal, so it's not a rhombus.
6. F(-1, 0), G(1, 3), H(4, 1), I(2, -2):
   - The slopes of FG and HI are both $-\frac{1}{3}$, and the slopes of GH and IF are both 3. This implies that the opposite sides are parallel, making it a parallelogram.
   - The lengths of FG and HI are not necessarily equal, so it's not a rhombus.
7. Square RSTU has vertices R(-3, -1), S(-1, 2), and 7(2, 0). Find the coordinates of vertex U:
   - The diagonals of a square bisect each other at right angles.
   - The midpoint of RS is $(-2, 0)$, and the midpoint of TU is also $(-2, 0)$.
   - The slope of RS is $\frac{(2-(-1))}{(-1-(-3))} = \frac{3}{2}$, so the slope of TU is $-\frac{2}{3}$ (negative reciprocal).

- Using the midpoint and slope, we can find the equation of the line passing through T and U: $y - 0 = \frac{(-\frac{2}{3})}{(x - (-2))}$.
- Solving for $x = 2$, we get $y = -2$. Therefore, the coordinates of U are $(2, -2)$.