Name _Schlansky_ Date _____

Mr. Schlansky Geometry

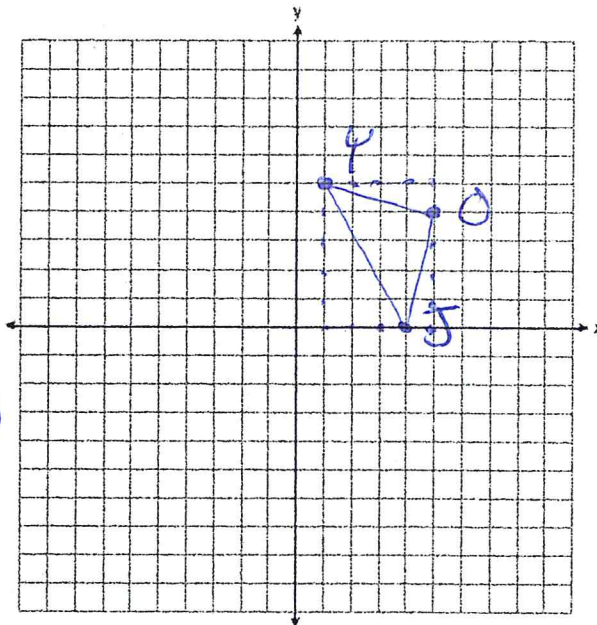# *Perimeter with Coordinate Geometry*

1. Triangle JOY has vertices J(4,0), O(5,4) and Y(1,5).
Find the perimeter of triangle JOY.

$d\,\overline{YO} = \sqrt{4^2+1^2} = \sqrt{16+1} = \sqrt{17}$

$d\,\overline{OJ} = \sqrt{1^2+4^2} = \sqrt{1+16} = \sqrt{17}$

$d\,\overline{JY} = \sqrt{3^2+5^2} = \sqrt{9+25} = \sqrt{34}$

$\sqrt{17} + \sqrt{17} + \sqrt{34} \boxed{= 2\sqrt{17} + \sqrt{34}}$

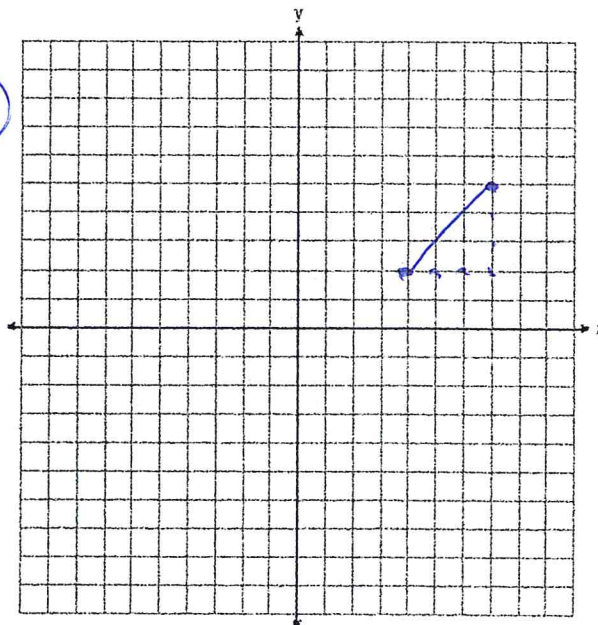2. Find the perimeter of an equilateral triangle whose side has endpoints $(4,2)$ and $(7,5)$.

3 equal sides

$d = \sqrt{3^2+3^2}$

$d = \sqrt{9+9}$

$d = \sqrt{18}$

$\overset{\wedge}{\underset{\sqrt{9}\ \ \sqrt{2}}{}}$

$3\sqrt{2}$

$3(3\sqrt{2}) \boxed{= 9\sqrt{2}}$

3. Rhombus *STAR* has vertices $S(-1, 2)$, $T(2, 3)$, $A(3, 0)$, and $R(0, -1)$. What is the perimeter of rhombus *STAR*?   4 equal sides
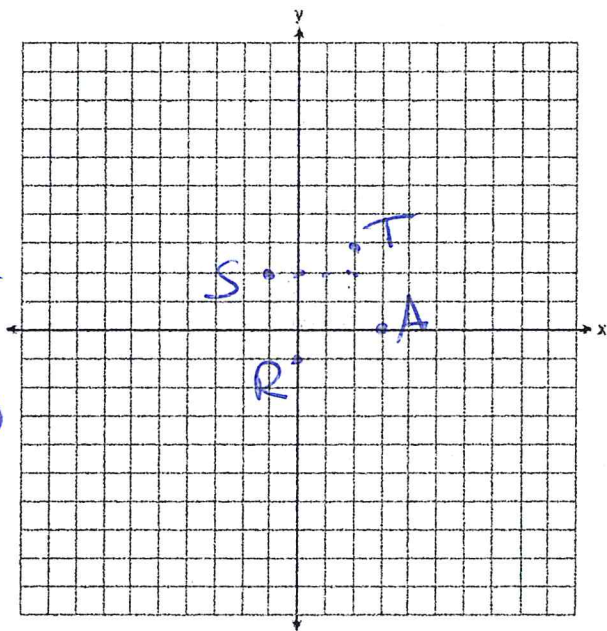   1) $\sqrt{34}$
   2) $4\sqrt{34}$ find distance of
   3) $\sqrt{10}$ any side
   4) $4\sqrt{10}$ $4\sqrt{10}$

$$d\overline{ST} = \sqrt{3^2 + 1^2}$$ $4\sqrt{10}$
$$d\overline{ST} = \sqrt{9+1}$$
$$d\overline{ST} = \sqrt{10}$$

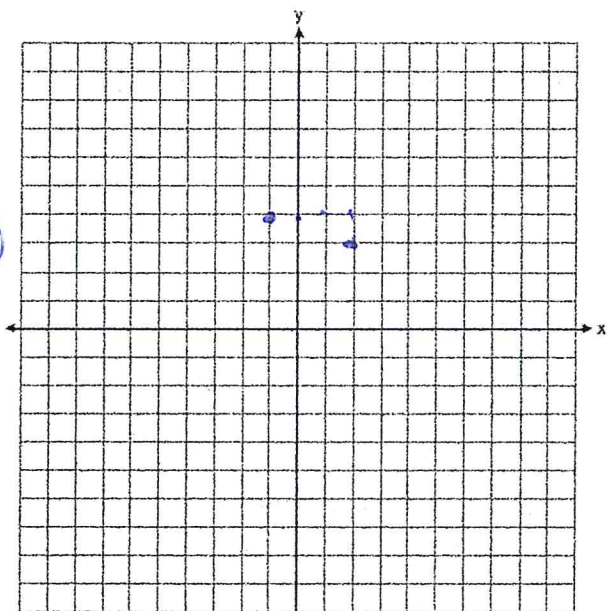4. The endpoints of one side of a regular pentagon are $(-1, 4)$ and $(2, 3)$. What is the perimeter of the pentagon?   5 equal sides
   1) $\sqrt{10}$
   2) $5\sqrt{10}$
   3) $5\sqrt{2}$
   4) $25\sqrt{2}$

$$d = \sqrt{3^2 + 1^2}$$ $5\sqrt{10}$
$$d = \sqrt{9+1}$$
$$d = \sqrt{10}$$

4 equal sides

5. The vertices of square *RSTV* have coordinates $R(-1, 5)$, $S(-3, 1)$, $T(-7, 3)$, and $V(-5, 7)$. What is the perimeter of *RSTV*?
   1) $\sqrt{20}$ 3) $4\sqrt{20}$
   2) $\sqrt{40}$ 4) $4\sqrt{40}$

find distance of any side
$$d\overline{TV} = \sqrt{2^2 + 4^2}$$
$$d\overline{TV} = \sqrt{4+16}$$ $4\sqrt{20}$
$$d\overline{TV} = \sqrt{20}$$