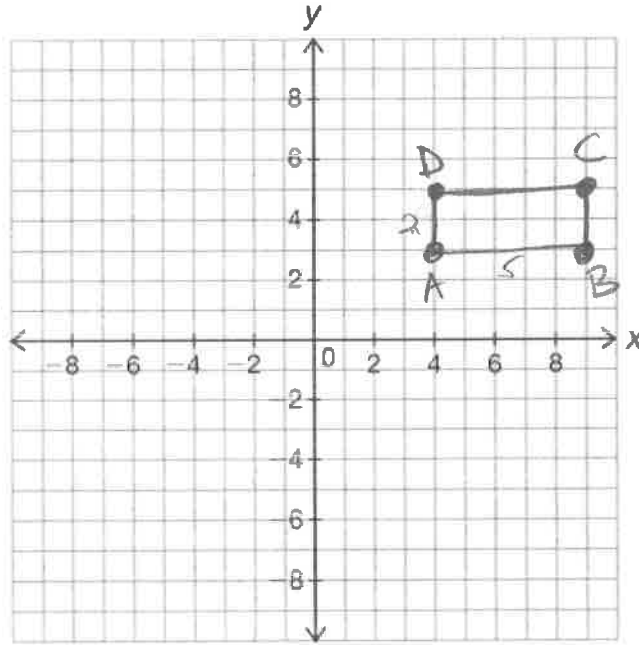


5-4 Area and Perimeter from Coordinates

- I can determine the area and perimeter of shapes from coordinates

1. Graph rectangle ABCD with vertices A(4, 3), B(9, 3), C(9, 5), and D(4, 5).



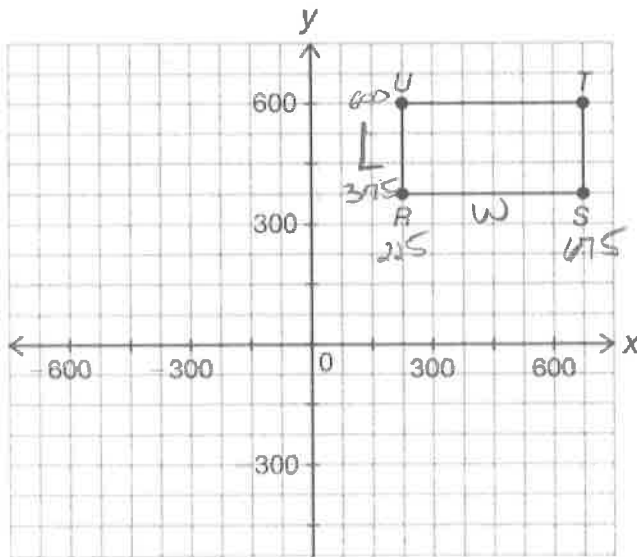
a. Find the perimeter of rectangle ABCD.

$$P = 2L + 2w = 4 + 10 = \boxed{14 \text{ units}}$$

b. Find the area of rectangle ABCD.

$$A = Lw = 2 \cdot 5 = \boxed{10 \text{ units}^2}$$

2. Using the graph below, find the area and perimeter of rectangle RSTU. Pay attention to the scales!



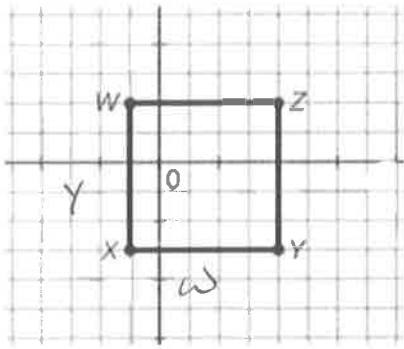
Scale = 75

$$w = 450$$

$$L = 225$$

$$P = 450 \cdot 2 + 225 \cdot 2 = 900 + 450 = \boxed{1350 \text{ units}}$$

3. Find the area and perimeter of the square below. (The x-axis and y-axis both increase by 2.)



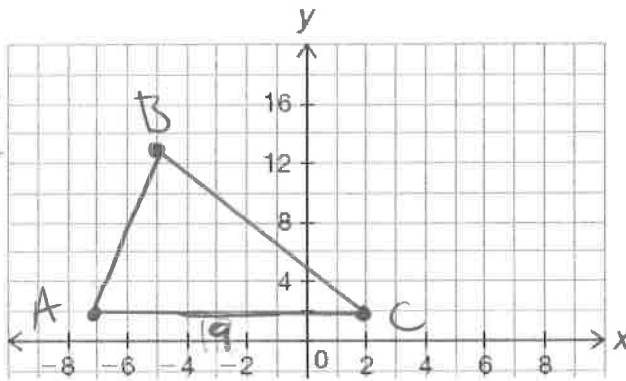
sides = 10

$$P = 4 \cdot 10 = 40 \text{ units}$$

$$A = L \cdot w = 10 \cdot 10 = 100 \text{ units}^2$$

4. Find the perimeter of a triangle with vertices at the coordinates $(-7, 2)$, $(-5, 13)$ and $(2, 2)$.

Watch the scale!



$\overline{AC} = 9$

$$\overline{AB}: 11^2 + 2^2 = d^2$$

$$121 + 4 = d^2$$

$$125 = d^2$$

$$d = \sqrt{125}$$

$$P = 9 + \sqrt{125} + \sqrt{170} \approx 33.22 \text{ units}$$

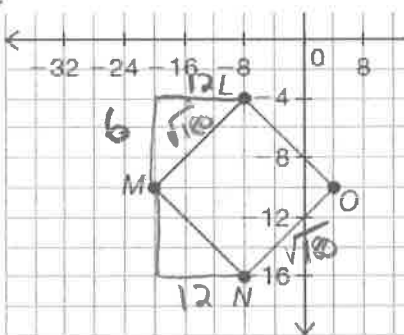
$$\overline{BC}: 11^2 + 7^2 = d^2$$

$$121 + 49 = d^2$$

$$d = \sqrt{170}$$

5. Find the perimeter of the figure below.

Watch the scale!
NOT a square,
probably a rhombus.



$$ML: 6^2 + 12^2 = d^2$$

$$36 + 144 = d^2$$

$$180 = d^2$$

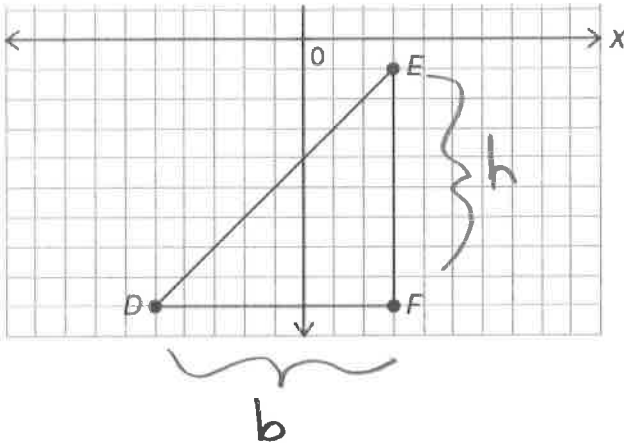
$$d = \sqrt{180}$$

$$MN: 6^2 + 12^2 = d^2$$

$$d = \sqrt{180}$$

$$P = 4 \cdot \sqrt{180} \approx 53.7 \text{ units}$$

6. Given the triangle below, determine the area and perimeter.



$$\overline{DF} = 8$$

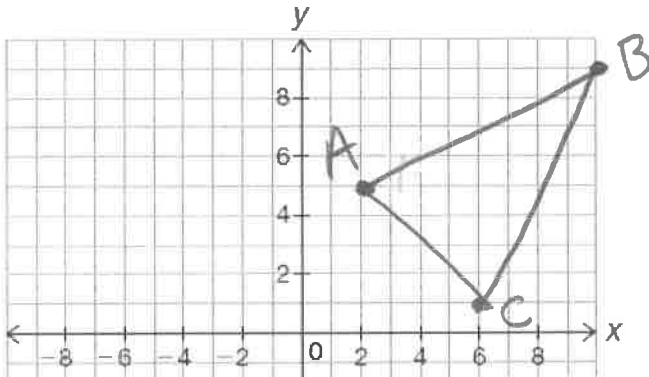
$$\overline{EF} = 8$$

$$\overline{DE} = \sqrt{8^2 + 8^2} = \sqrt{128} \approx 11.3$$

$$P = 8 + 8 + \sqrt{128} \approx \boxed{27.3 \text{ units}}$$

$$A = \frac{1}{2}bh = \frac{1}{2}(8)(8) = 4 \cdot 8 = \boxed{32}$$

7. Graph triangle ABC with vertices $A(2, 5)$, $B(10, 9)$ and $C(6, 1)$. Determine the perimeter.



$$\overline{AB} = \sqrt{4^2 + 8^2} = \sqrt{80}$$

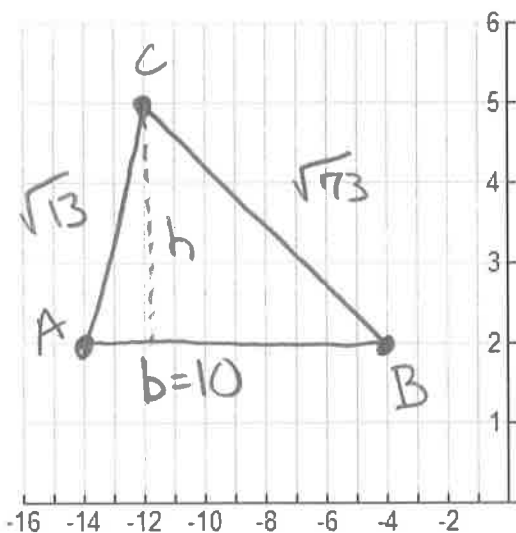
$$\overline{BC} = \sqrt{4^2 + 8^2} = \sqrt{80}$$

$$\overline{CA} = \sqrt{4^2 + 4^2} = \sqrt{32}$$

$$P = \sqrt{80} + \sqrt{80} + \sqrt{32}$$

$$\approx \boxed{23.5}$$

8. Graph triangle ABC with vertices $A(-14, 2)$, $B(-4, 2)$ and $C(-12, 5)$. Determine the area and perimeter.



$$\overline{AB} = 10$$

$$\overline{AC} = \sqrt{2^2 + 3^2} = \sqrt{13}$$

$$\overline{BC} = \sqrt{8^2 + 3^2} = \sqrt{73}$$

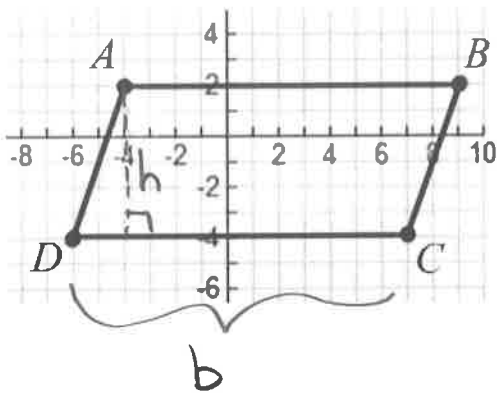
$$P = 10 + \sqrt{13} + \sqrt{73} \approx \boxed{22.1 \text{ units}}$$

$$A = \frac{1}{2}bh = \frac{1}{2} \cdot 10 \cdot 3 = 5 \cdot 3$$

$$= \boxed{15 \text{ units}^2}$$

Opposite sides are equal

9. Find the area and perimeter of the parallelogram below.



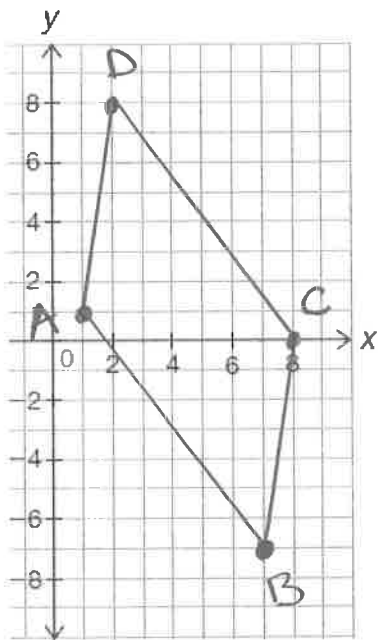
$$\overline{AB} = \overline{CD} = 13$$

$$\overline{AD} = \overline{BC} = \sqrt{2^2 + 6^2} = \sqrt{40}$$

$$P = 2 \cdot 13 + 2 \cdot \sqrt{40} \approx \boxed{38.6 \text{ units}}$$

$$A = b \cdot h = 13 \cdot 6 = \boxed{78 \text{ units}^2}$$

10. Graph parallelogram ABCD with vertices A(1, 1), B(7, -7), C(8, 0) and D(2, 8) and determine the perimeter.

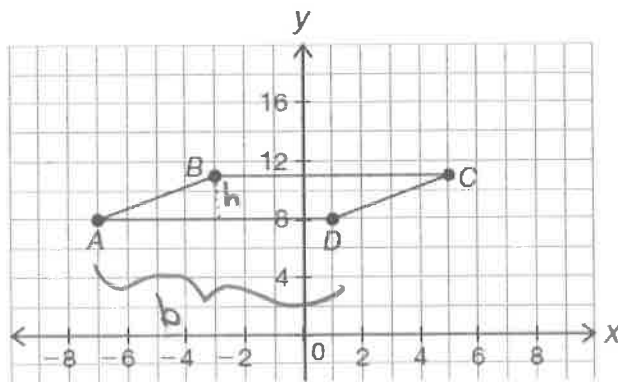


$$\overline{AD} = \overline{BC} = \sqrt{1^2 + 7^2} = \sqrt{50}$$

$$\overline{AB} = \overline{DC} = \sqrt{6^2 + 8^2} = \sqrt{100} = 10$$

$$P = 2 \cdot \sqrt{50} + 2 \cdot 10 \approx \boxed{34.1 \text{ units}}$$

11. Find the area and perimeter of the parallelogram below.



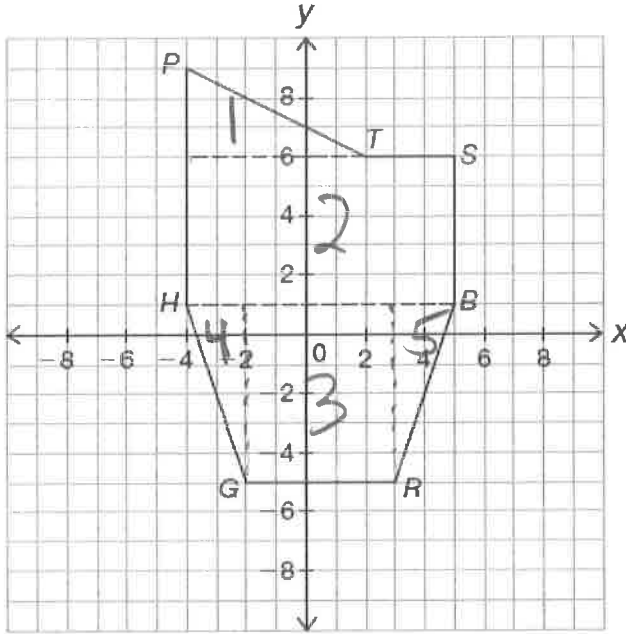
$$\overline{BC} = \overline{AD} = 8$$

$$\overline{AB} = \overline{DC} = \sqrt{3^2 + 4^2} = \sqrt{25} = 5$$

$$P = 2 \cdot 8 + 2 \cdot 5 = \boxed{26 \text{ units}}$$

$$A = b \cdot h = 8 \cdot 4 = \boxed{32 \text{ units}^2}$$

12. Find the area and perimeter of the figure below.
(Hint for area: split the figure into multiple shapes.)



$$\overline{PT} = \sqrt{3^2 + 6^2} = \sqrt{45}$$

$$\overline{TS} = 3$$

$$\overline{SB} = 5$$

$$\overline{BR} = \sqrt{2^2 + 6^2} = \sqrt{40}$$

$$\overline{RG} = 5$$

$$\overline{GH} = \sqrt{40}$$

$$\overline{HP} = 8$$

$$P = \sqrt{45} + 3 + 5 + \sqrt{40} + 5 + \sqrt{40} + 8$$

$$\approx \boxed{40.4 \text{ units}}$$

$$A_1 = \frac{1}{2}bh = \frac{1}{2} \cdot 6 \cdot 3 = 9$$

$$A_2 = L \cdot w = 5 \cdot 9 = 45$$

$$A_3 = L \cdot w = 6 \cdot 5 = 30$$

$$A_4 = A_5 = \frac{1}{2}bh = \frac{1}{2} \cdot 2 \cdot 6 = 6 \times 2$$

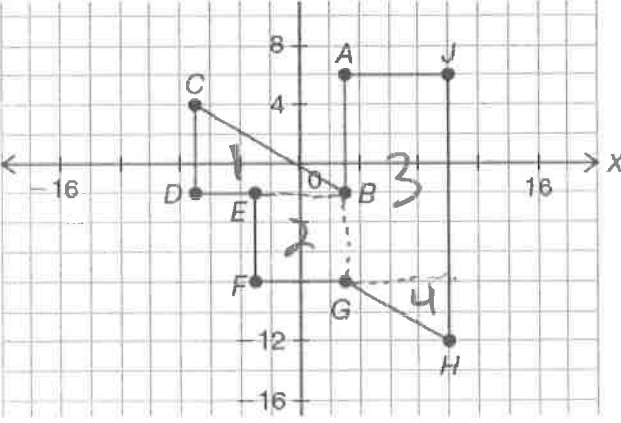
↳ two small triangles

$$A = 9 + 45 + 30 + 12$$

$$= \boxed{96 \text{ units}^2}$$

13. Find the area and perimeter of the figure below.
(Hint for area: split the figure into multiple shapes.)

*** Watch the scales!



$$\overline{AB} = 8$$

$$\overline{BC} = \sqrt{10^2 + 6^2} = \sqrt{136}$$

$$\overline{CD} = 6$$

$$\overline{DE} = 4$$

$$\overline{EF} = 6$$

$$\overline{FG} = 6$$

$$\overline{GH} = \sqrt{4^2 + 7^2} = \sqrt{65}$$

$$\overline{HS} = 18$$

$$\overline{JA} = 7$$

$$P \approx \boxed{74.7 \text{ units}}$$

$$A_1 = \frac{1}{2}bh = \frac{1}{2} \cdot 10 \cdot 6 = 30$$

$$A_2 = S^2 = 6^2 = 36$$

$$A_3 = L \cdot w = 14 \cdot 7 = 98$$

$$A_4 = \frac{1}{2}bh = \frac{1}{2} \cdot 7 \cdot 4 = 14$$

$$A = \boxed{178 \text{ units}^2}$$