

Name: \_\_\_\_\_

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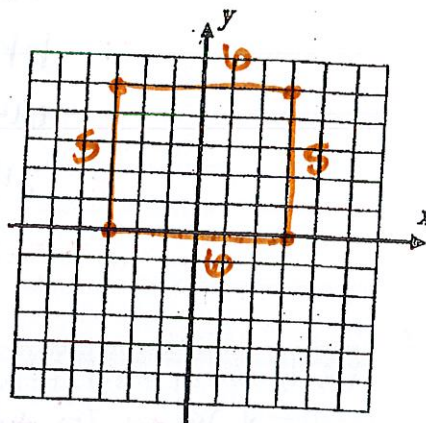
### Finding the Areas of Polygons Using the Coordinate Plane

### Algebra 1 Homework **classwork**

1. Calculate the perimeter and area of quadrilateral  $ABCD$  if it has vertices at  $A(-3, 0)$ ,  $B(3, 0)$ ,  $C(3, 5)$  and  $D(-3, 5)$ .

$$\begin{aligned} \text{Perimeter} &= 2l + 2w \\ &= 2(6) + 2(5) \\ &= 12 + 10 \\ &= 22u \end{aligned}$$

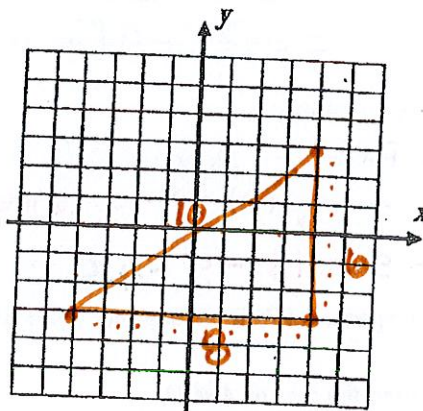
$$\begin{aligned} \text{Area} &= bh \\ &= 6(5) \\ &= 30u^2 \end{aligned}$$



2. Calculate the perimeter and area of  $\triangle ABC$  whose coordinates are  $A(-4, -3)$ ,  $B(4, -3)$  and  $C(4, 3)$ .

$$\text{Perimeter: } 10 + 8 + 6 = 24u$$

$$\begin{aligned} A &= \frac{1}{2}bh \\ &= \frac{1}{2}(8)(6) \\ &= \frac{1}{2}(48) \\ &= 24u^2 \end{aligned}$$

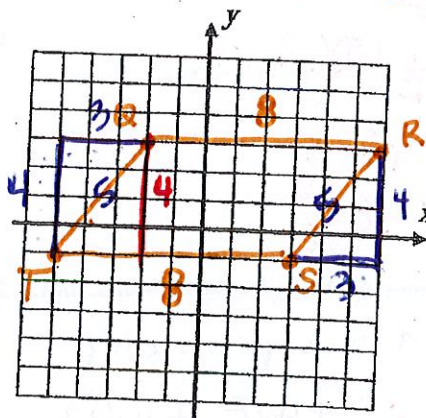


$$\begin{aligned} 8^2 + 6^2 &= \\ 64 + 36 &= 100 \end{aligned}$$

3. Calculate the perimeter and area of parallelogram  $QRST$  whose vertices are located at  $Q(-2, 3)$ ,  $R(6, 3)$ ,  $S(3, -1)$  and  $T(-5, -1)$ .

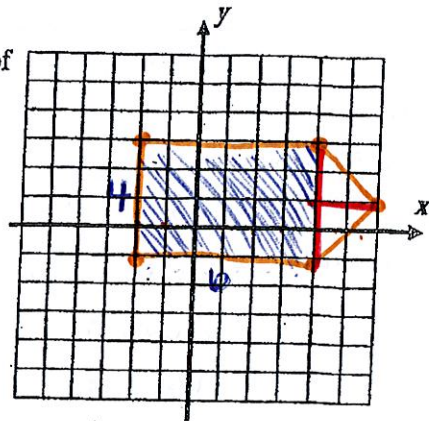
$$\text{Perimeter: } 26u$$

$$\begin{aligned} A &= bh \\ &= (8)(4) \\ &= 32u^2 \end{aligned}$$



4. Calculate the area of pentagon  $EFGHI$  if it has vertices of  $E(6,1)$ ,  $F(4,3)$ ,  $G(-2,3)$ ,  $H(-2,-1)$ , and  $J(4,-1)$ .

$$\begin{aligned}
 \text{Area of Pent.} &= \text{Area of Rect} + \text{Area of } \Delta \\
 &= bh + \frac{1}{2}bh \\
 &= (4)(4) + \frac{1}{2}(4)(2) \\
 &= 24 + 4 \\
 &= 28 \text{ u}^2
 \end{aligned}$$



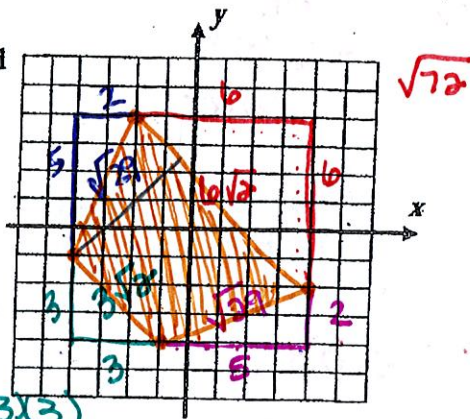
5. Trapezoid  $ABCD$  has vertices  $A(-2, 4)$ ,  $B(4, -2)$ ,  $C(-1, -4)$  and  $D(-4, -1)$ . Find the area of  $ABCD$ .

$$\begin{aligned}
 \text{perimeter} &= \sqrt{29} + 6\sqrt{2} + \sqrt{29} + 3\sqrt{2} \\
 &= 2\sqrt{29} + 9\sqrt{2} \text{ u}
 \end{aligned}$$

$$A_{\text{TRAP}} = \frac{1}{2}h(b_1 + b_2)$$

Area of Rect - Areas of 4  $\Delta$ 's

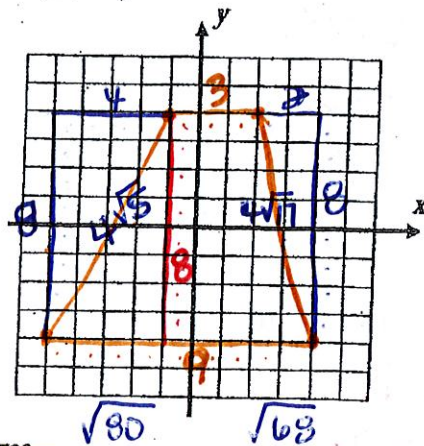
$$\begin{aligned}
 &= (8)(8) - \frac{1}{2}(5)(2) - \frac{1}{2}(6)(6) - \frac{1}{2}(5)(2) \\
 &= 64 - 5 - 18 - 5 - 4.5 = 31.5 \text{ u}^2 \quad -\frac{1}{2}(3)(3)
 \end{aligned}$$



6. Trapezoid  $ABCD$  has vertices  $A(-1, 4)$ ,  $B(2, 4)$ ,  $C(4, -4)$  and  $D(-5, -4)$ .

(a) Find the area of  $ABCD$ .

$$\begin{aligned}
 A_{\text{TRAP}} &= \frac{1}{2}h(b_1 + b_2) \\
 &= \frac{1}{2}(8)(9 + 3) \\
 &= 4(12) \\
 &= 48 \text{ u}^2
 \end{aligned}$$



(b) Using right triangle trigonometry, find  $m\angle D$  to the nearest degree.

Find the perimeter

$$\underline{9} + \underline{3} + 4\sqrt{5} + 4\sqrt{17} = 12 + 4\sqrt{5} + 4\sqrt{17} \text{ u}$$