

1. What is the slope of the line $y = -3x + 1$? -3 What is the slope of a line parallel to this line? -3
 (the same)

What is the slope of the line perpendicular to this line? 1/3
 (opposite reciprocal)

2. What is the slope of the line perpendicular to $y = \frac{2}{3}x + 8$? m = -3/2
 (opp. rec)

3. Provide an equation for a perpendicular to the line $y = \frac{4}{5}x + 4$.

$m = -\frac{5}{4}$ y = -5/4x + 6 (your y-intercept can be +/- any number)

4. Write the equation for the line that passes through points (2, 5) & (-2, 4).

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 5}{-2 - 2} = \frac{-1}{-4} = \frac{1}{4}$ $m = \frac{1}{4}$ y = 1/4x + 4.5
 $5 = \frac{1}{4}(2) + b$
 $5 = \frac{1}{2} + b$ $4.5 = b$
 $\frac{-1}{2} - \frac{-1}{2}$

5. Write the equation of a line that is parallel to the line $y = 3x - 3$.

$m = 3$ y = 3x + 4 (you can use any y-int)

6. Write the equation of the line that is parallel to $y = x - 1$ and passes through the point (2, 6).

$m = 1$ y = mx + b $b = 1(2) + b$ y = x + 4
 $b = 2 + b$
 $4 = b$

7. Write the equation of a line that is perpendicular to the line $y = 8x + 7$.

$m = -\frac{1}{8}$ y = -1/8x - 3 (you can use any y-int)

8. What is the slope of the line that passes through points (8, 0) & (-2, 4)? Write the equation of the line.

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 0}{-2 - 8} = \frac{4}{-10} = -\frac{2}{5}$ y = -2/5x + 3.2
 $0 = -\frac{2}{5}(8) + b$
 $0 = -3.2 + b$ b = 3.2

9. What is the distance between (3, -3) & (7, 2)? Write the equation of the line that passes through these points.

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(7 - 3)^2 + (2 + 3)^2}$$

$$\sqrt{(4)^2 + (5)^2}$$

$$\sqrt{16 + 25} = \sqrt{41} \text{ or } 6.40$$

Eq: $m = \frac{2 + 3}{7 - 3} = \frac{5}{4}$ y = 5/4x - 6.75

(7, 2)
x y

$$y = mx + b$$

$$2 = \frac{5}{4}(7) + b$$

$$2 = 8.75 + b$$

$$-8.75 - 8.75$$

$$-6.75 = b$$

10. What is the perimeter of a triangle with vertices (-1, 3), (0, 4), & (0, 3)?

*use distance formula 3 times.

A B C

$$AB = \sqrt{(0+1)^2 + (4-3)^2} = \sqrt{2} \quad \boxed{\sqrt{2} + 2 \text{ or } 3.41}$$

$$BC = \sqrt{(0-0)^2 + (3-4)^2} = \sqrt{1} = 1$$

$$AC = \sqrt{(0+1)^2 + (3-3)^2} = \sqrt{1} = 1$$

11. Find the perimeter of quadrilateral RSTV.

*use distance formula 4 times OR use Pyth. Theorem 4 times.

$$5\sqrt{2} + 5\sqrt{2} + 3\sqrt{10} + \sqrt{90} = \boxed{33.12}$$

$$7^2 + 1^2 = x^2 \quad 7^2 + 1^2 = x^2$$

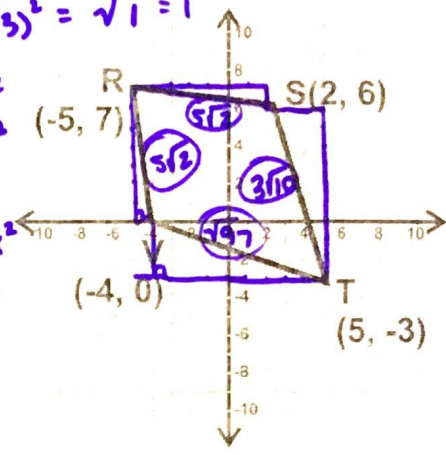
$$\sqrt{50} = x \quad \sqrt{50} = x$$

$$5\sqrt{2} \quad 5\sqrt{2}$$

$$3^2 + 9^2 = x^2 \quad 3^2 + 9^2 = x^2$$

$$\sqrt{90} = x \quad \sqrt{90} = x$$

$$3\sqrt{10} \quad 3\sqrt{10}$$



12. Find the area of quadrilateral RSTV.

$$A = 60$$

13. Find the midpoint of the segment with endpoints at (1, 4) & (4, 6). $m_x m_y = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$$\left(\frac{1+4}{2}, \frac{4+6}{2}\right) = \left(\frac{5}{2}, 5\right) \text{ or } (2.5, 5)$$

14. Partition the segment with endpoints at (-2, 3) & (10, 6) at a ratio of 1:2.

$$(x, y) = \left(x_1 + \frac{a}{a+b}(x_2 - x_1), y_1 + \frac{a}{a+b}(y_2 - y_1)\right)$$

$$-2 + \frac{1}{3}(12) = 2 \quad 3 + \frac{1}{3}(6-3) = 4 \quad \boxed{(2, 4)}$$

15. Partition the segment with endpoints (12, 12) & (-3, 2) at a ratio of 1:4.

$$12 + \frac{1}{5}(-15) = 9 \quad 12 + \frac{1}{5}(-10) = 10 \quad \boxed{(9, 10)}$$

16. Write the equation of the line that would complete the parallelogram MATH. Then, find its perimeter and area.

$$m = -1 \quad (4, 4) \quad y = mx + b$$

$$4 = -1(4) + b$$

$$4 = -4 + b$$

$$+4 \quad +4$$

$$8 = b$$

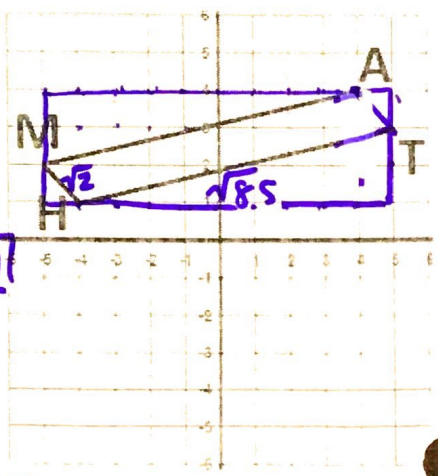
$$\boxed{y = -x + 8}$$

perimeter:

$$\sqrt{2} + \sqrt{2} + \sqrt{85}$$

$$+ \sqrt{85} =$$

$$2\sqrt{2} + 2\sqrt{85} = \boxed{21.27}$$



Area: $30 - 9 - 9 - 1 = \boxed{11}$

17. Are the lines that pass through (3, -1) & (4, 2) and (1, 1) & (-3, 4) parallel, perpendicular, coincidental, or none?

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad \frac{2 - (-1)}{4 - 3} = \frac{3}{1}$$

$$m = \frac{4 - 1}{-3 - 1} = \frac{3}{-4}$$

$\boxed{\text{None}}$