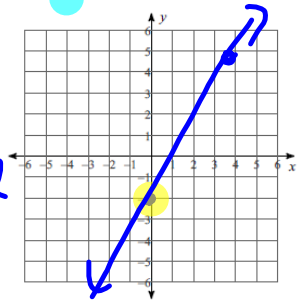
Welcome Back!! Warm-up

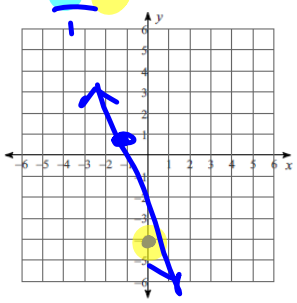
Sketch the graph of each line.

1) $y = \frac{7}{4}x - 2$



Horizontal ↔ y=#

2) $y = -5x - 4$

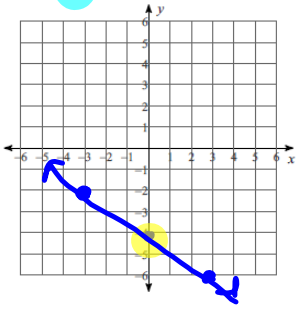


Rise / Run

$\frac{+}{+} = +$

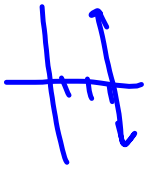
$\frac{-}{-} = +$

3) $y = -\frac{2}{3}x - 4$

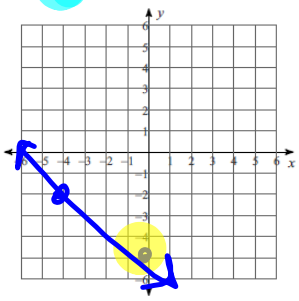


Vertical ↕ X=#

X=3



4) $y = \frac{3}{4}x - 5$



$\frac{+}{-} = -$

$\frac{-}{+} = -$

Review of Distance, Midpoint, and Equations of Lines

Distance:

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

1. Find the distance between (3, -5) and (-2, 1).

x_1, y_1 x_2, y_2

$d = \sqrt{(-2-3)^2 + (1--5)^2}$

$d = \sqrt{25 + 36}$

$d = \sqrt{61}$

$d \approx 7.8$

2. Use the distance formula to find the value of x if the distance between (2, 1) and (x, 7) is 10 units.

$10 = \sqrt{(x-2)^2 + (7-1)^2}$

$(10)^2 = \left(\sqrt{(x-2)^2 + 36}\right)^2$

$100 = (x-2)^2 + 36$

$-36 \quad -36$

$\sqrt{64} = \sqrt{(x-2)^2}$

$\pm 8 = x - 2$

$+2 \quad +2$

$2 \pm 8 = x$

$10 = x$

$-6 = x$

Midpoint:

Midpoint Formula: $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

3. Find the midpoint between (1, -2) and (-3, 6).

Calc

$(1+-3)/2$

$\frac{-2}{2}$

$\frac{1+-3}{2}$, $\frac{-2+6}{2}$

$(-1, 2)$

4. M is the midpoint of segment AB. The coordinates of A are (-2, 3) and the coordinates of M are (1, 0). Find the coordinates of B.

$2 \cdot \frac{-2+x}{2} = 1 \cdot 2$ $\quad$ $2 \cdot \frac{3+y}{2} = 0 \cdot 2$

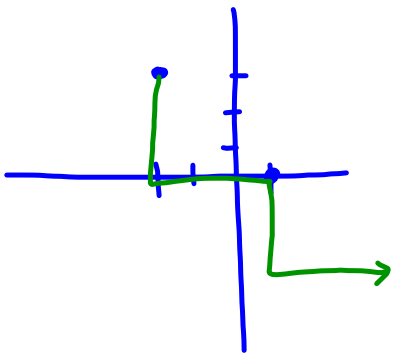
A (-2,3) M (1,0) B (x,y)

(4, -3)

$-2+x=2$ $\quad$ $3+y=0$

$+2 \quad +2$ $\quad$ $-3 \quad -3$

$x=4$ $\quad$ $y=-3$



Parallel and Perpendicular Lines:

Write the equation in slope intercept form of the line parallel and line perpendicular to given line through given point.

	Same Parallel	Opp. rec. Perpendicular
1) $y = 2x + 3$ (—4, —9)	_____	_____

$m = 2$ $(-4, -9)$ $m = -\frac{1}{2}$ $(-4, -9)$

$y = mx + b$

$-9 = 2(-4) + b$

$-9 = -8 + b$

$+8 \quad +8$

$-1 = b$

$y = 2x - 1$

$-9 = \frac{-1}{2}(-4) + b$

$-9 = 2 + b$

$-2 \quad -2$

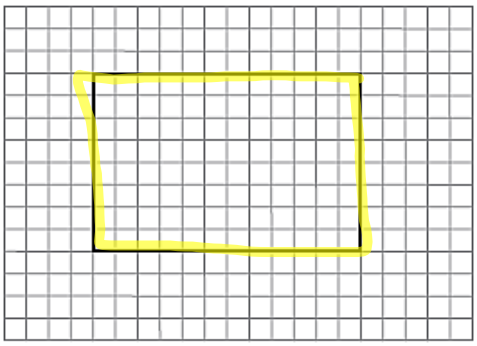
$-11 = b$

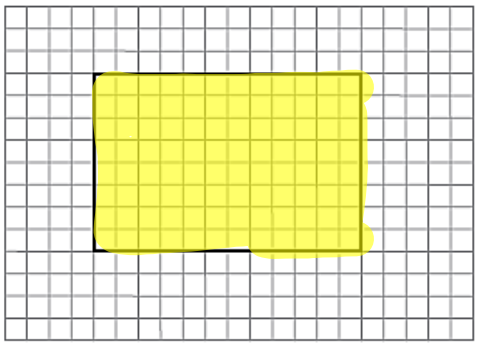
$y = -\frac{1}{2}x - 11$

Now that you have learned how to calculate the distance between two points, you can use the distance formula to help you calculate the area and perimeter of figures on a coordinate plane.

Perimeter: Sum of the length of each side of a shape

Area: Amount of square units or space inside of a shape



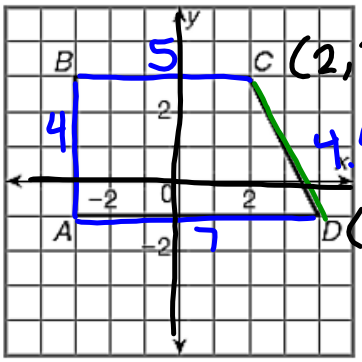


In order to calculate the perimeter or area of a shape, you have to know the length of certain sides and heights. If those sides or heights lie along the grid lines, you can just count the number of squares from one end of the side to the other.

However, if the figured is rotated or slanted, the sides or heights may not lie along the grid lines because they are diagonal. It is not enough to estimate the side lengths; you must be accurate in determining the lengths of the necessary sides and heights.

What formula can you use if the sides are slanted/diagonal to find the lengths? $d = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

Practice: Calculate the perimeter of the following figures. Think about which sides you need to calculate the lengths.



C (2,3) D (4,-1)

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

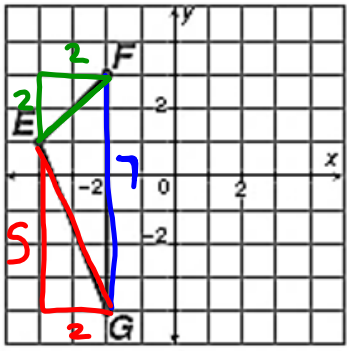
$d=\sqrt{4+16}$

$d=\sqrt{20}$

$d=4.5$

$P=5+4+7+4.5$

$P=20.5$



$EF^2=2^2+2^2$

$EF^2=4+4$

$EF^2=8$

$EF=\sqrt{8}$

$EG^2=2^2+5^2$

$EG^2=4+25$

$EG^2=29$

$EG=\sqrt{29}$

E(-4,1) F(-2,3)

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

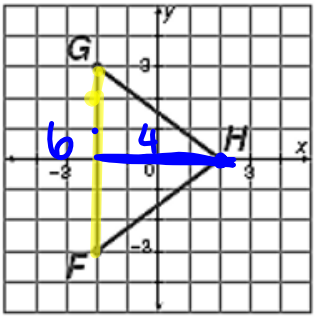
$d=\sqrt{4+4}$

$d=\sqrt{8}$

$P=7+2.8+5.4$

$P=15.2$

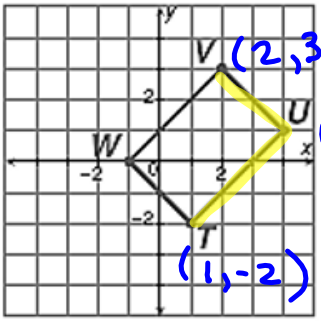
Practice: Calculate the area of the following figures. Think about which sides you need to calculate the lengths.



$A = \frac{1}{2}b \cdot h$

$A = \frac{1}{2} \cdot 6 \cdot 4$

$A = 12$



$A = bh$

$A = LW$

$A = \sqrt{8} \cdot \sqrt{18}$

$A = 12$

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

$VU = \sqrt{4+4}$

$VU = \sqrt{8}$ 2.8

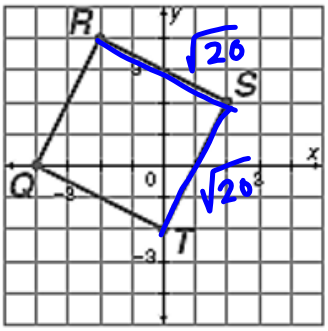
$UT = \sqrt{(1-4)^2 + (-2-1)^2}$

$UT = \sqrt{9+9}$

$UT = \sqrt{18}$ 4.2

$A = 2.8(4.2)$

$A = 11.76$



$\sqrt{20} \cdot \sqrt{20}$

20

$4.5 \cdot 4.5$

20.25