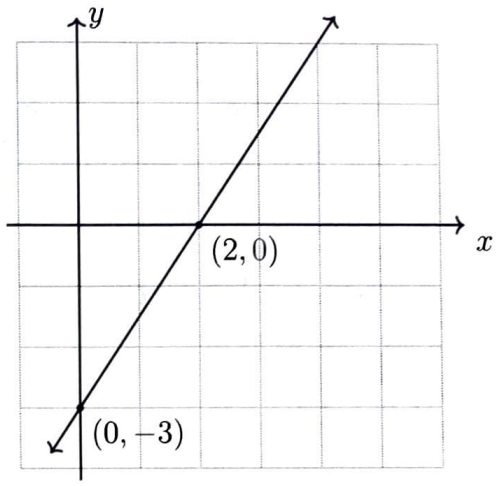
6.13 Test: Analytic geometry **8.F.A.3**

1. A line is plotted in the graph below.



   (a) Write down the y-intercept of the line.

   -3

   (b) What is the slope of the line?

   $\frac{3}{2}$

   (c) What is the x-intercept of the line?

   2

   (d) Write down its equation in slope-intercept form.

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

2. Find the slope of the line through the points $(-2, 3)$ and $(4, 5)$.

$$m = \frac{5-3}{4-(-2)} = \frac{2}{6} = \frac{1}{3}$$

3. A line has a slope of $\frac{3}{5}$ and passes through the point $(10, 2)$.

   (a) Write the equation of the line in the form $(y - y_0) = m(x - x_0)$.

   $y - 2 = \frac{3}{5}(x - 10)$

   (b) Rewrite the equation in the form $y = mx + b$.

   $y - 2 = \frac{3}{5}x - 6$

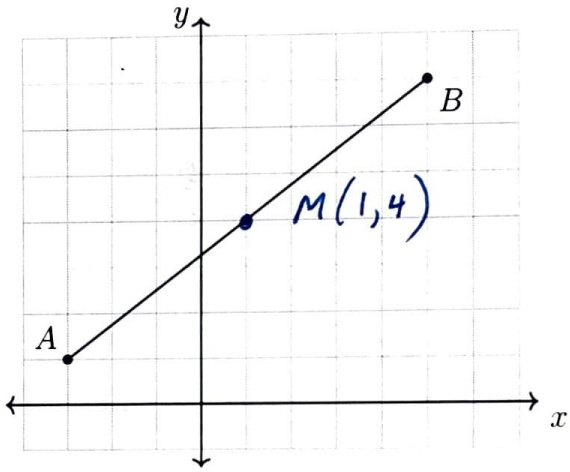
   $y = \frac{3}{5}x - 4$

The midpoint formula **HSG.GPE.B.6**

4. In the diagram below, $\overline{AB}$ has endpoints with coordinates $A(-3,1)$ and $B(5,7)$. Find the coordinates of the midpoint M of $\overline{AB}$. Mark and label it on the graph.

$M = \left(\frac{-3+5}{2}, \frac{1+7}{2}\right)$

$= (1, 4)$



5. Find the midpoint of $\overline{PQ}$ if $P(5,11)$ and $Q(1,4)$.

$M = \left(\frac{5+1}{2}, \frac{11+4}{2}\right)$

$= \left(3, 7\frac{1}{2}\right)$

6. Given the midpoint $M(6,4)$ of $\overline{AB}$ with $A(2,3)$. Find the coordinates of point B. The use of the grid below is optional.

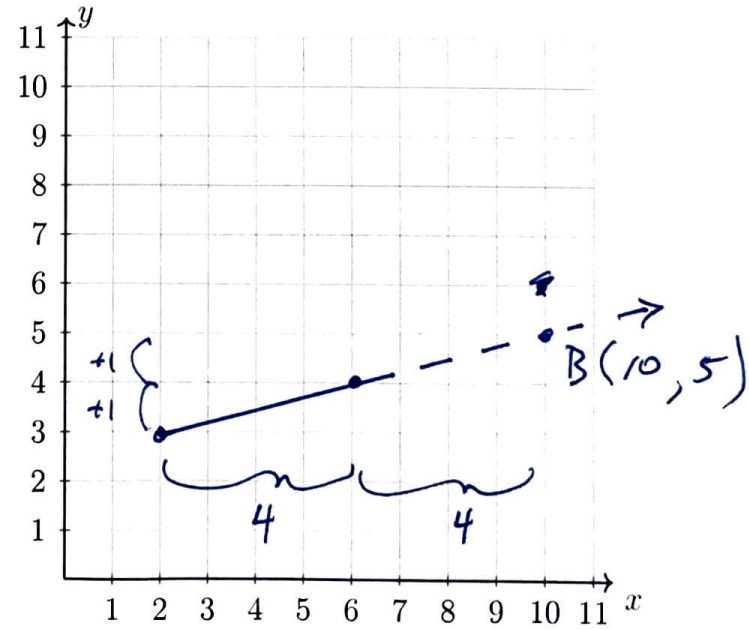
$M = \left(\frac{2+x}{2}, \frac{3+y}{2}\right) = (6,4)$

$\frac{2+x}{2} = 6$ $\quad$ $\frac{3+y}{2} = 4$

$2+x = 12$ $\quad$ $3+y = 8$

$x = 10$ $\quad$ $y = 5$

$M = (10, 5)$



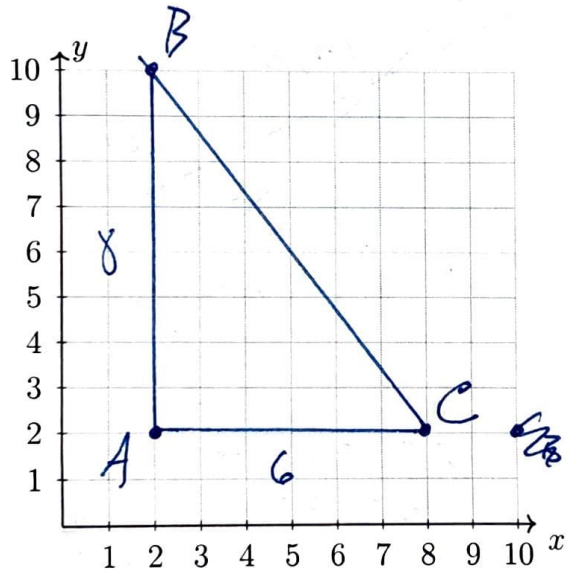
The distance formula **8.G.B.8**

7. Use the distance formula to find the length of $\overline{RS}$ if $R(1, 17)$ and $S(9, 2)$.

(8, 15, 17)

$$RS = \sqrt{(9-1)^2 + (2-17)^2}$$
$$= \sqrt{8^2 + (-15)^2}$$
$$= \sqrt{64 + 225} = \sqrt{289} = 17$$

8. Graph and label $\triangle ABC$, $A(2, 2)$, $B(2, 10)$, $C(8, 2)$.



Find the lengths of its sides.

(a) $AB =$ 8

(b) $AC =$ 6

(c) $BC =$ $\sqrt{8^2 + 6^2}$

$= \sqrt{64+36}$

$= \sqrt{100}$

$= 10$

Parallel and perpendicular slopes **HSG.GPE.B.5**

9. The slope of a line is $m = -\frac{3}{5}$. What is the slope of the line parallel to it?

$-\frac{3}{5}$

10. What is the slope a line perpendicular to the line $y = 2x + 7$?

$-\frac{1}{2}$

Systems of equations x = number of oranges y = # of pineapples **8.G.B.8**

11. Lenny buys fruit for a picnic. Oranges cost \$1 and pineapples cost \$2 each. The total cost is \$10 for seven pieces of fruit. Find the number of each kind of fruit purchased.

$x+y=7$

$y=-x+7$

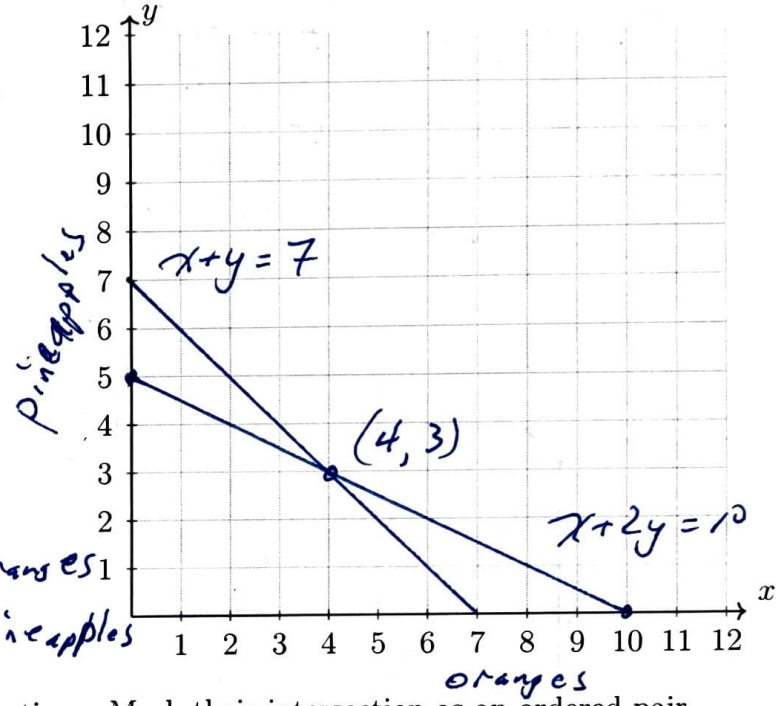
$x+2y=10$

$x+2(-x+7)=10$

$x-2x+14=10$

$y=x$

$y=3$



4 oranges
3 pineapples
(4, 3)

12. Graph and label the two equations. Mark their intersection as an ordered pair.

$f(x)=x-3$

$2=(5)-3$ ✓

$g(x)=-\frac{3}{5}x+5$

$2=-\frac{3}{5}(5)+5$

$2=-3+5$ ✓