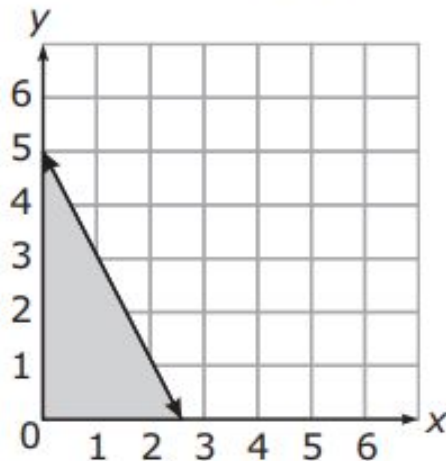2   What scenario could be modeled by the graph below?

A   The number of pounds of apples, y, minus two times the number of pounds of oranges, x, is at most 5.

B   The number of pounds of apples, y, minus half the number of pounds of oranges, x, is at most 5.

C   The number of pounds of apples, y, plus two times the number of pounds of oranges, x, is at most 5.

D   The number of pounds of apples, y, plus half the number of pounds of oranges, x, is at most 5.

Unit Map - Geometry

~~Wednesday - Parallel Lines Cut by a Transversal~~
~~Thursday - Proving Lines Parallel and Perpendicular~~
~~Friday - Pythagorean Theorem and its Converse~~
Monday - Distance and Midpoint Formula
Tuesday - Use coordinates to solve geometric problems
Wednesday - NO SCHOOL - TEACHERS MARCH
Thursday - Geometry Review
Friday - Geometry Test

Announcements

Last unit! Geometry!

Geometry test on Friday

Flashback Friday

EOC review will begin soon - The EOC will be on May 30th.

Panera Study Day on May 27 from 2-5 PM

Homework Check - Worksheet

Distance and Midpoint Formula

4/29/2019

Line Segment: Part of a line that has two endpoints. The line segment is named by these two endpoints.

Midpoint: The distance halfway between two points

Segment Bisector: A line that cuts a second line directly in half (located at the midpoint).

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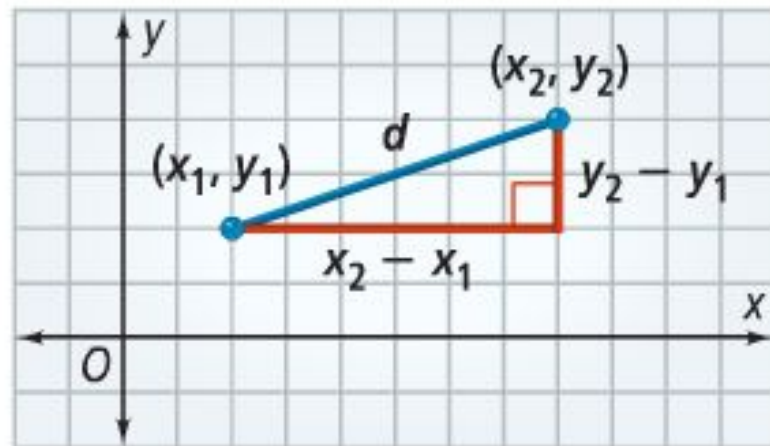
The Distance Formula	The Midpoint Formula
$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	

Example 1

What is the distance between points (1, 1) and (7, 9)?

Let $(x_1, y_1) = (1, 1)$ and $(x_2, y_2) = (7, 9)$.

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$ Use the Distance Formula.

$$= \sqrt{(7 - 1)^2 + (9 - 1)^2}$$ Substitute for (x_1, y_1) and (x_2, y_2).

$$= \sqrt{(6)^2 + (8)^2} = 10$$ Simplify.

The Distance Formula
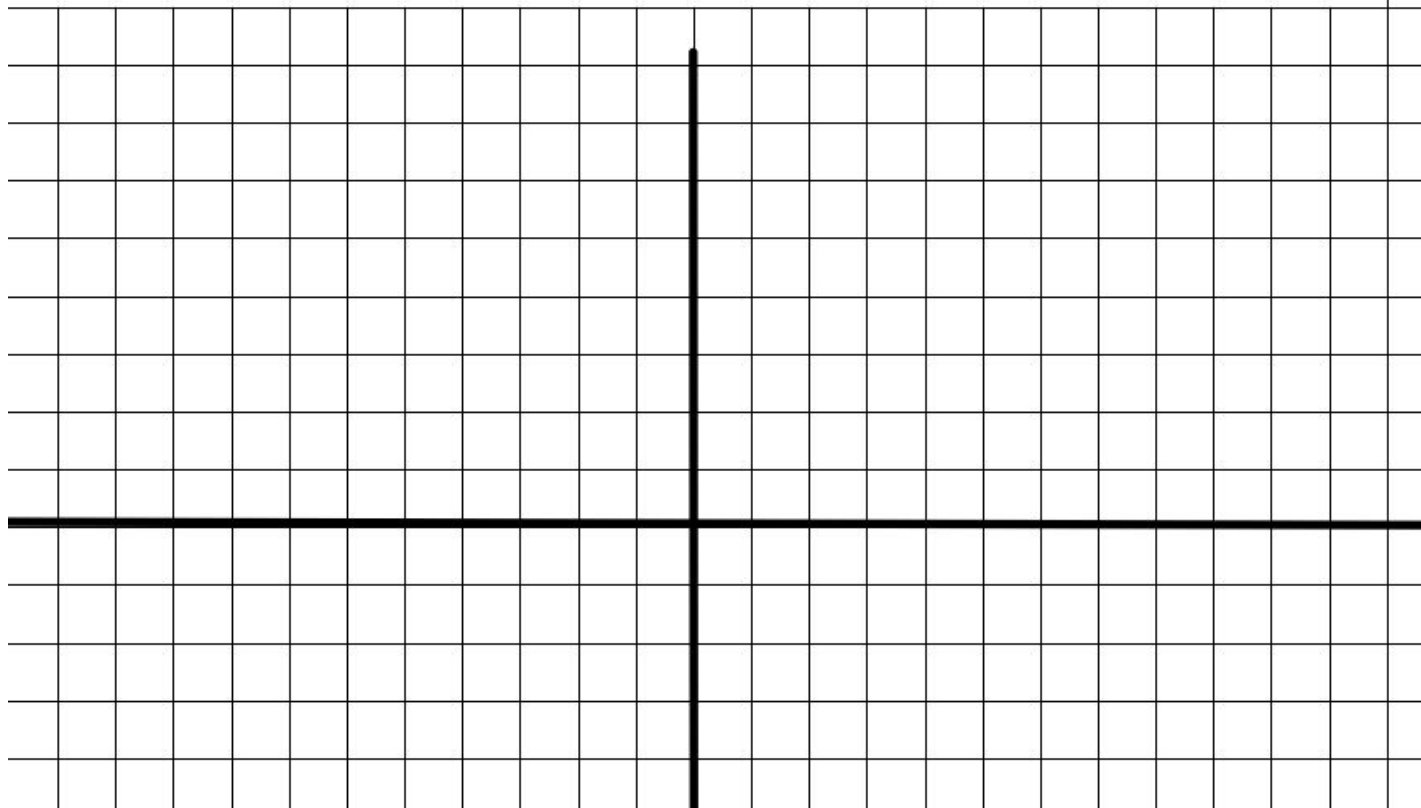
Find the distance between each of the following points.

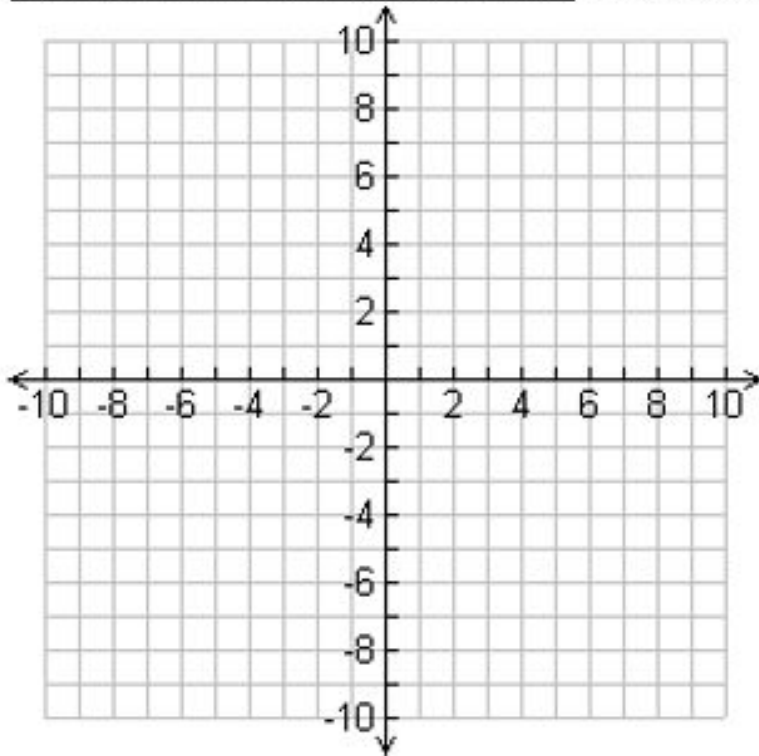   a)R(5, 1) and S(-3, -3)   b)T(0, 0) and P(12, 8)

   c) J (-1, 3) and K (11, 2)   d) A (2, 1) and B (6, 4)

c) A triangle has vertices at (1, 3), (2, -3) and (-1, -1). What is the approximate perimeter of the triangle? Draw a picture to help.

**Discovering The Midpoint Formula:** Find the midpoint between each of the following points.

a) E (-2, 6) and F (10, -8) – use the graph to the left.

b) M(11, -2) and N(-9, 13)

c) R is the midpoint of segment $\overline{PS}$. Q is the midpoint of segment $\overline{RS}$. P is located at (8, 10) and S is located at (12, -6). What are the coordinates of Q? Draw and label a picture to help.

The *midpoint* of a line segment is the point M on the segment that is the same distance from each endpoint, (x_1, y_1) and (x_2, y_2). The coordinates of M are given by the *midpoint formula*:

$$M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$
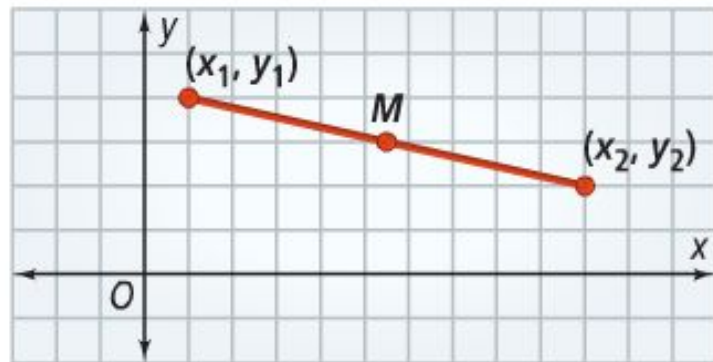
The Distance Formula	The Midpoint Formula
$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	$M\left(\dfrac{x_1 + x_2}{2}, \dfrac{y_1 + y_2}{2}\right)$

Example 2

What is the midpoint of the line segment with endpoints $(3, 6)$ and $(-5, 1)$?

Let $(x_1, y_1) = (3, 6)$ and $(x_2, y_2) = (-5, 1)$.

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right) = \left(\frac{3 + (-5)}{2}, \frac{6 + 1}{2}\right) \qquad \text{Substitute for } (x_1, y_1) \text{ and } (x_2, y_2).$$

$$= \left(-1, 3\frac{1}{2}\right) \qquad \text{Simplify.}$$

Practice:

Find the midpoint of the line segment joining the two points.

1. $(-1, 3), (11, -2)$

2. $(2, 1), (6, 4)$

3. $(-4, 1), (11, 9)$

Midpoint Formula: Working It Backwards

A •━━━━━━━━━━━━━━━━━━━━ B •━━━━━━━━━━━━━━━━━━━━ C •

┌───┐
│ **Split Formula in Two:**   │
├──────────────────────────────┬──────────────────────────┤
│   │   │
│ 1. Plug in what you know   │ 1. Plug in what you know │
│ 2. Solve for x_2 │ 2. Solve for x_2 │
└──────────────────────────────┴──────────────────────────┘

Find the coordinates of C if B (4, 3) is the midpoint of AC and A is located at (6, -12).

Putting it Together

What is the approximate length of the segment $\overline{CD}$ if $\overline{CD}$ bisects $\overline{AB}$ at C and A (3, 5), B (7, -3), and D (-4, 2)? *Draw and label a picture to help.*

23 A line segment has endpoints $J(2, 4)$ and $L(6, 8)$. The point K is the midpoint of $\overline{JL}$. What is an equation of a line perpendicular to $\overline{JL}$ and passing through K?
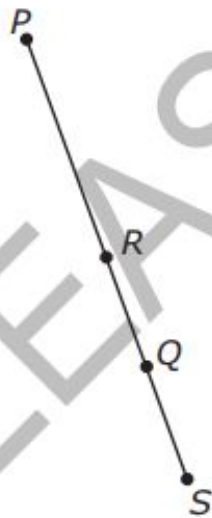
A $y = {}^-x + 10$

B $y = {}^-x - 10$

C $y = x + 2$

D $y = x - 2$

34 R is the **midpoint** of segment PS. Q is the midpoint of segment RS.

P is located at (8, 10), and S is located at (12, ⁻6). What are the coordinates of Q?

A   (4, 2)

B   (2, ⁻8)

C   (11, ⁻2)

D   (10, 2)

Homework

Distance and Midpoint Worksheet posted on my website