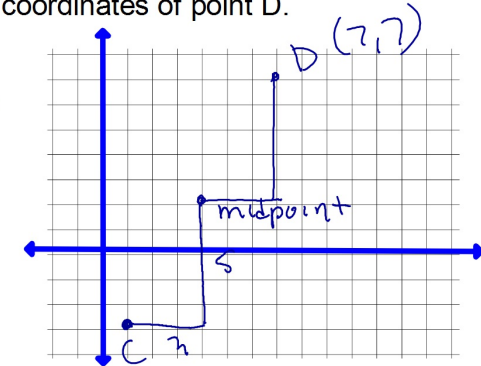MIDPOINT FORMULA:

The midpoint M of a segment whose endpoints
are A($x_1$ , $y_1$) and B($x_2$ , $y_2$) is

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

---

The midpoint of segment CD is (4,2).
If Point C is (1,-3) find the coordinates of point D.

You could plot Point C and the midpoint then
find the distance from C to the midpoint. Beginning
at the midpoint you could move this same distance
to find the location of Point D.



D (7,7)

midpoint

5

C 7

---

The midpoint of segment CD is (4,2).
If Point C is (1,-3) find the coordinates of point D.

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

You could also use the midpoint formula.

x-coord of point D:

$$2 \cdot \frac{x+1}{2} = 4 \cdot 2$$

$$x+1 = 8$$
$$\quad -1 \quad -1$$
$$x = 7$$

y-coord of point D:

$$2 \cdot \frac{y+-3}{2} = 2 \cdot 2$$

$$y+-3 = 4$$
$$\quad +3 \quad +3$$
$$y = 7$$

Point D:
(7,7)

---

The midpoint of segment EF is (-5,2).
If Point E is (8,11) find the coordinates of point F.

Using either of the previous methods you will get:

F(-18, -7)

Find the coordinates of two points, E & F, whose midpoint would be (-3,6).

An example of an infinite number of possible answers is shown below.

E ( -1 , 10 )

F ( -5 , 2 )

- When you add the x-coordinates and divide by 2 you should get -3. Therefore, the x-coordinates must have a sum of -6
- When you add the y-coordinates and divide by 2 you should get 6. Therefore, the y-coordinates must have a sum of 12.

Graphically you could plot the Midpoint and choose a slope. Using the slope you could do rise and run in one direction and stop then go back to the midpoint and do rise and run in the other direction and stop.
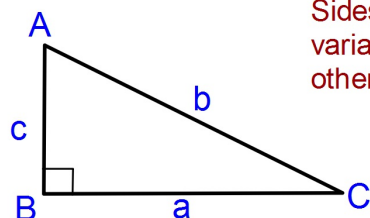
Use a slope of 2/3

E (0,8)

F(-6,4)

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Opposite Leg

Hypotenuse
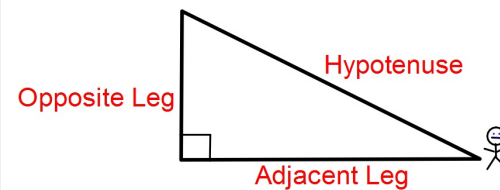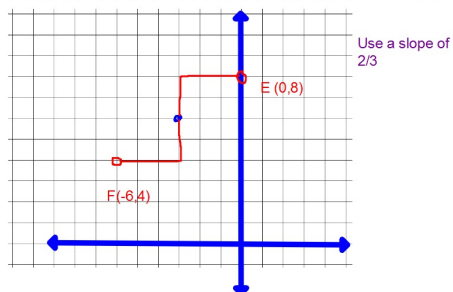
Adjacent Leg

Opposite means "across from"

Adjacent means "next to"

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△ABC is shown below

Angles are labeled with Capital Letters and sides are labeled with Lower Case Letters.



Sides and angles with the same variable should be opposite each other.

A

b

c

B    a    C

---

## Trigonometry

Trigonometry is the study of triangles.

(The name comes from Greek trigonon "triangle" + metron "measure") .

Trigonometric Ratios:

The ratio of sides in a right triangle

Sine, Cosine, & Tangent