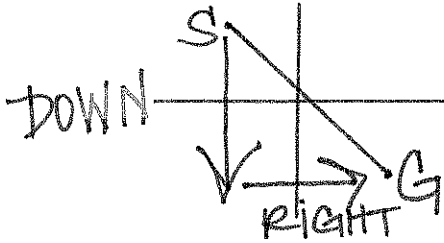Find the coordinates of point E on the directed line segment $\overline{SG}$ for $S(-3, 7)$ and $G(7, -8)$ that partitions it into a ratio of 3:2.

x_1, y_1

x_2, y_2

1. Sketch a coordinate plane and identify where S & G are located. Determine the "route" from S to G.

DOWN
↓ RIGHT

2. Find the rise: $|y_2 - y_1|$

$$|-8 - 7| = |-15| = 15$$

3. Find the run: $|x_2 - x_1|$

$$|7 - (-3)| = |10| = 10$$

4. Determine the fraction formed by the ratio:

$$\text{ratio}: a{:}b \quad \text{fraction}: \frac{\text{part}}{\text{whole}} = \frac{a}{a+b}$$

$3:2$

$$\frac{3}{5}$$

5. To find the x-coordinate of the point E, multiply the run by the fraction (in step 4) and then...
   a. Add to the x-coordinate of S if going right.
   b. Subtract from the x-coordinate of S if going left.

$S(-3, 7)$

$$\rightarrow 10 \cdot \frac{3}{5} = 6$$

$$-3 + 6 = 3$$

6. To find the y-coordinate of the point E, multiply the rise by the fraction (in step 4) and then...
   a. Add to the y-coordinate of S if going up.
   b. Subtract from the y-coordinate of S if going down.

$$\rightarrow 15 \cdot \frac{3}{5} = 9$$

$$7 - 9 = -2$$

7. You now have the coordinates of the point E.

$$E(3, -2)$$