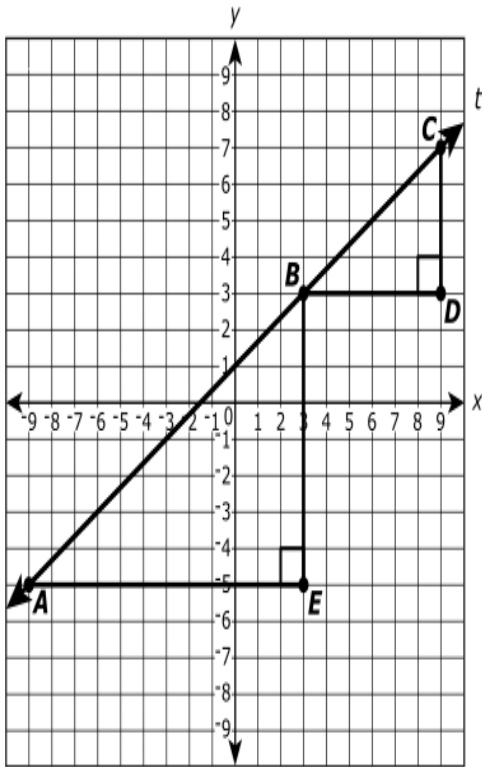


Math
Released Item 2016

Grade 8

Similar Triangles
VH007137

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .



Part A

Select from the drop-down menu to correctly complete the sentence.

The slope of segment AB is the slope of segment BC .

Part B

Use the ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

Part C

Write an equation for line t . Show or explain how you determined your equation.

Enter your equation and your work or explanation in the space provided.

Rubric Part A (Machine Scored)

Score	Description
1	<p>Student response includes the following element.</p> <ul style="list-style-type: none"> • Computation component = 1 point <ul style="list-style-type: none"> ○ The student provides a response that indicates the slope of \overline{AB} is equal to the slope of \overline{BC}.
0	Student response is incorrect or irrelevant.

Rubric Part B

Score	Description
1	<p>Student response includes the following element.</p> <ul style="list-style-type: none"> • Reasoning component = 1 point <ul style="list-style-type: none"> ○ The student correctly reasons that $\frac{BE}{EA} = \frac{CD}{DB}$, so both \overline{AB} and \overline{BC} have the same slope. <p>Sample Student Response: "The ratio $\frac{BE}{EA} = \frac{8}{12} = \frac{2}{3}$. The ratio $\frac{CD}{DB} = \frac{4}{6} = \frac{2}{3}$. Since the ratio of the sides of each triangle is $\frac{2}{3}$, the ratios are equal, so $\frac{BE}{EA} = \frac{CD}{DB}$. This means that both segments have the same slope."</p>
0	Student response is incorrect or irrelevant.

Rubric Part C

Score	Description
2	<p>Student response includes the following 2 elements.</p> <ul style="list-style-type: none"> • Computation component = 1 point <ul style="list-style-type: none"> ○ The student determines a correct equation for line t of $y = \frac{2}{3}x + 1$ • Reasoning component = 1 point <ul style="list-style-type: none"> ○ The student shows or explains that line t has a slope of $\frac{2}{3}$ and a y-intercept of 1. <p>Sample Student Response: "To find the slope of line t, I can take any two points on the line and find the ratio of the rise to the run. Using points A and B, I found the slope to be $\frac{3 - (-5)}{3 - (-9)} = \frac{8}{12} = \frac{2}{3}$. Then I identified the y-intercept of line t by looking at its graph. The line crosses the y-axis at $y=1$, so the y-intercept is 1. Therefore, the equation of line t is $y = \frac{2}{3}x + 1$."</p>

	<p>Notes:</p> <ul style="list-style-type: none"> • The student may receive a combined total of 2 points if the reasoning processes are correct but the student makes one or more computational errors resulting in incorrect answers. • The student may receive a total of 2 points if he or she computes the correct answers but shows no explanation or insufficient explanation to indicate a correct reasoning. • The student cannot receive more than 1 point for reasoning if the explanations, while sufficient to indicate that the student had correct reasoning, contain nonsense statements.
1	Student response includes 1 of the above elements.
0	Student response is incorrect or irrelevant.

Anchor Set

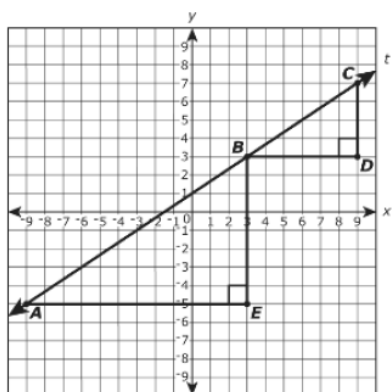
A1 – A8

With Annotations

Part B: Score Point 1

Part C: Score Point 2

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .

**Part A**

Use the drop-down menu to complete the statement.

The slope of segment AB is the slope of segment BC .

Part B

Use ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

The slope of segment AB is $\frac{8}{12}$.
While the slope of segment BC is $\frac{4}{6}$.
These segments have the same slopes because they are equivalent.

Part C

Write an equation for line t . Show or explain how you determined your equation.

$y = \frac{2}{3}x + 1$
The y -intercept of the equation is 1 as it is on the graph. Then the slope is $\frac{2}{3}$ as it is shown on the graph.

Anchor Paper 1

Part B: Score Point 1

This response receives full credit. The response includes the required element.

- This response correctly reasons that $\frac{BE}{EA} = \frac{CD}{DB}$, so both \overline{AB} and \overline{BC} have the same slope (The slope of segment AB is $\frac{8}{12}$. While the slope of segment BC is $\frac{4}{6}$. These segments have the same slopes because they are equivalent).

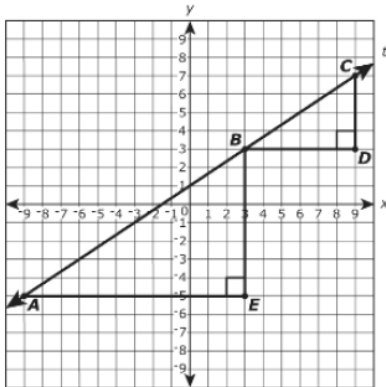
Part C: Score Point 2

This response receives full credit. The response includes each of the two required elements.

- This response provides the correct equation for line t ($y = \frac{2}{3}x + 1$).
- This response shows or explains how the student determined that line t has a slope of $\frac{2}{3}$ and a y-intercept of 1 (The *y-intercept* of the equation is 1 as it is on the graph. Then the slope is $\frac{2}{3}$ as it is shown on the graph).

Part B: Score Point 1
Part C: Score Point 2

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .



Part A

Use the drop-down menu to complete the statement.

The slope of segment AB is the slope of segment BC .

Part B

Use ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

both ratios of side lengths are $\frac{2}{3}$
leaving the slope of AB and BC to be equal.

Part C

Write an equation for line t . Show or explain how you determined your equation.

$Y = \frac{2}{3}x + 1$
the line as a 2 to 3 slope and crosses at 1 on the y axis

Anchor Paper 2

Part B: Score Point 1

This response receives full credit. The response includes the required element.

- This response correctly reasons that $\frac{BE}{EA} = \frac{CD}{DB}$, so both \overline{AB} and \overline{BC} have the same slope (both ratios of side lengths are $\frac{2}{3}$ leaving the slope of AB and BC to be equal).

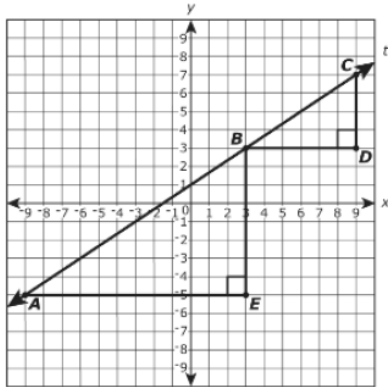
Part C: Score Point 2

This response receives full credit. The response includes each of the two required elements.

- This response provides the correct equation for line t ($Y = \frac{2}{3}x + 1$).
- This response shows or explains how the student determined that line t has a slope of $\frac{2}{3}$ and a y-intercept of 1 (the line is a 2 to 3 slope and crosses at 1 on the y axis).

Part B: Score Point 0
Part C: Score Point 2

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .



Part A

Use the drop-down menu to complete the statement.

The slope of segment AB is the slope of segment BC .

Part B

Use ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

\overline{AB} and \overline{BC} are both located along \overleftrightarrow{T} thus they have the same slope.

Part C

Write an equation for line t . Show or explain how you determined your equation.

$y = \frac{2}{3}x + 1$
 \overleftrightarrow{T} has a slope of $\frac{2}{3}$ and intercepts the y axis at $+1$

☐

Annotation

Anchor Paper 3

Part B: Score Point 0

This response receives no credit. The response does not include the required element.

This response insufficiently reasons that $\frac{BE}{EA} = \frac{CD}{DB}$, so both \overline{AB} and \overline{BC} have the same slope (\overline{AB} and \overline{BC} are both located along \vec{T} thus they have the same slope). While a correct explanation is provided indicating that line segments AB and BC are on line T so they have the same slope, this response did not use ratios to explain, so credit is not received.

Part C: Score Point 2

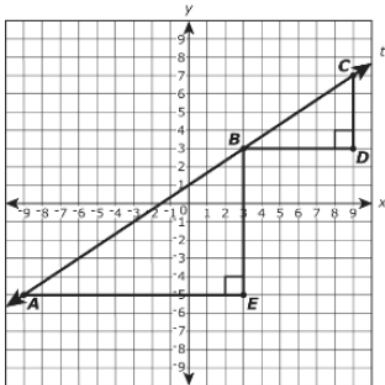
This response receives full credit. The response includes each of the two required elements.

- This response provides the correct equation for line t ($y = \frac{2}{3}x + 1$).
- This response shows or explains how the student determined that line t has a slope of $\frac{2}{3}$ and a y-intercept of 1 (\vec{T} has a slope of $\frac{2}{3}$ and intercepts the y axis at +1).

Part B: Score Point 1

Part C: Score Point 1

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .

**Part A**

Use the drop-down menu to complete the statement.

The slope of segment AB is the slope of segment BC .

Part B

Use ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

The ratios of the side lengths of the triangles are both equal to $\frac{2}{3}$

Part C

Write an equation for line t . Show or explain how you determined your equation.

an equation for line t would be

$$y = \frac{2}{3}x + 1$$

I used the equation $y = mx + b$ and filled in the variables

Anchor Paper 4

Part B: Score Point 1

This response receives full credit. The response includes the required element.

- This response correctly reasons that $\frac{BE}{EA} = \frac{CD}{DB}$, so both \overline{AB} and \overline{BC} have the same slope (The ratio of the side lengths of the triangles are both equal to $\frac{2}{3}$).

Part C: Score Point 1

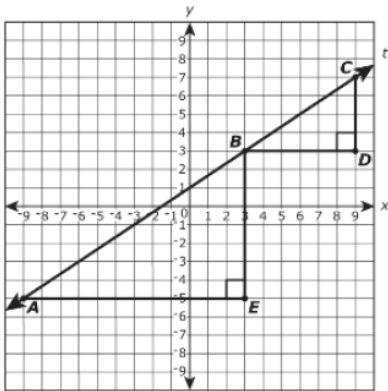
This response receives partial credit. The response includes one of the two required elements.

- This response provides the correct equation for line t ($y = \frac{2}{3}x + 1$).

This response does not sufficiently show or explain how the student determined that line t has a slope of $\frac{2}{3}$ and a y-intercept of 1 (I used the equation $y = mx + b$ and filled in the variables).

Part B: Score Point 1
Part C: Score Point 0

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .



Part A

Use the drop-down menu to complete the statement.

The slope of segment AB is the slope of segment BC .

Part B

Use ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

$\frac{4}{6}$
 $\frac{8}{12}$
both the ratio's and slopes equal to eachother and simplify down to $\frac{2}{3}$

Part C

Write an equation for line t . Show or explain how you determined your equation.

$$2 \times t$$

Anchor Paper 5

Part B: Score Point 1

This response receives full credit. The response includes the required element.

- This response correctly reasons that $\frac{BE}{EA} = \frac{CD}{DB}$, so both \overline{AB} and \overline{BC} have the same slope ($\frac{4}{6}$; $\frac{8}{12}$ both the ratio's and slopes equal to each other and simplify down to $\frac{2}{3}$).

Part C: Score Point 0

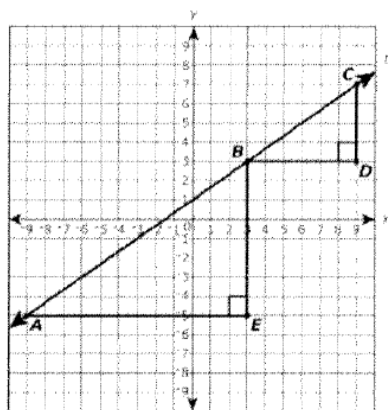
This response receives no credit. The response includes none of the two required elements.

This response provides an incorrect equation for line t ($2 \times t$). This response does not show or explain how the student determined that line t has a slope of $\frac{2}{3}$ and a y-intercept of 1.

Part B: Score Point 0

Part C: Score Point 1

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .

**Part A**

Use the drop-down menu to complete the statement.

The slope of segment AB is Choose... the slope of segment BC .

Part B

Use ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

e angle and d angle each have 90 degrees

Part C

Write an equation for line t . Show or explain how you determined your equation.

$$y = \frac{2}{3}x + 1$$

Annotation

Anchor Paper 6

Part B: Score Point 0

This response receives no credit. The response does not include the required element.

This response does not correctly explain that $\frac{BE}{EA} = \frac{CD}{DB}$, so both \overline{AB} and \overline{BC} have the same slope (e angle and d angle each have 90 degrees).

Part C: Score Point 1

This response receives partial credit. The response includes one of the two required elements.

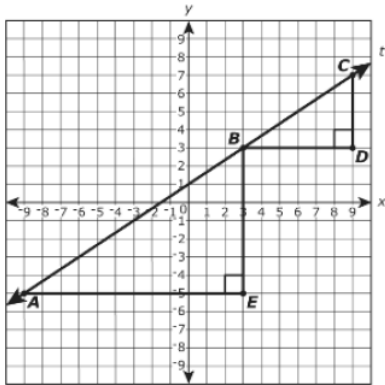
- This response provides the correct equation for line t ($y = \frac{2}{3}x + 1$).

This response does not show or explain how the student determined that line t has a slope of $\frac{2}{3}$ and a y-intercept of 1.

Part B: Score Point 0

Part C: Score Point 0

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .

**Part A**

Use the drop-down menu to complete the statement.

The slope of segment AB is the slope of segment BC .

Part B

Use ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

the ratios of the side lengths are $6 / 12$ and $4 / 8$ or $1 / 2$ so that means that the slope of the line segments are the same

Part C

Write an equation for line t . Show or explain how you determined your equation.

$$m = \frac{2}{3} + 1$$

Anchor Paper 7

Part B: Score Point 0

This response receives no credit. The response does not include the required element.

This response does not correctly explain that $\frac{BE}{EA} = \frac{CD}{DB}$, so both \overline{AB} and \overline{BC} have the same slope (the ratios of the side lengths are $6/12$ and $4/8$ or $1/2$ so that means that the slope of the line segments are the same).

Part C: Score Point 0

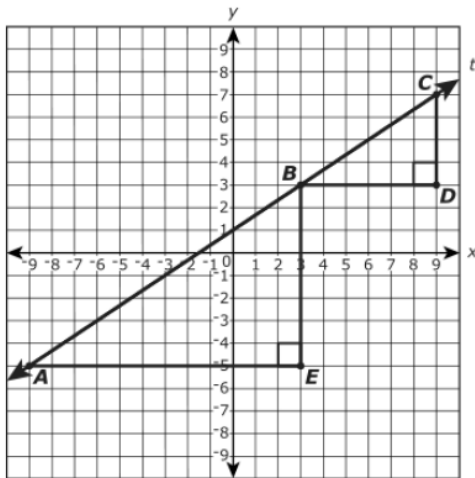
This response receives no credit. The response includes none of the two required elements.

This response provides an incorrect equation for line t ($m = \frac{2}{3} + 1$). This response does not show or explain how the student determined that line t has a slope of $\frac{2}{3}$ and a y-intercept of 1.

Part B: Score Point 0

Part C: Score Point 0

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .

**Part A**

Choose the correct phrase to complete the sentence.

The slope of segment AB is the slope of segment BC .

Part B

Use ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

The line is a straight line so it goes straight all the way from A to B and B to C.

Part C

Write an equation for line t . Show or explain how you determined your equation.

$$y = \frac{3}{2x} + 1$$

Annotation

Anchor Paper 8

Part B: Score Point 0

This response receives no credit. The response does not include the required element.

This response does not correctly explain that $\frac{BE}{EA} = \frac{CD}{DB}$, so both \overline{AB} and \overline{BC} have the same slope (The line is a straight line so it goes straight all the way from A to B and B to C).

Part C: Score Point 0

This response receives no credit. The response includes none of the two required elements.

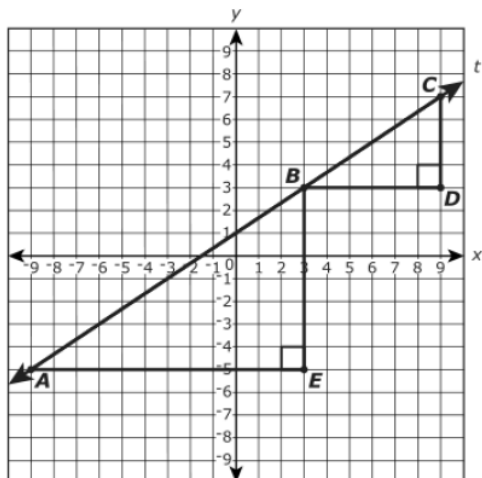
This response provides an incorrect equation for line t by reversing the slope to $\frac{run}{rise}$ instead of $\frac{rise}{run}$ ($y = \frac{3}{2x} + 1$). This response does not show or explain how the student determined that line t has a slope of $\frac{2}{3}$ and a y-intercept of 1.

Practice Set

P101 - P105

No Annotations Included

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .



Part A

Choose the correct phrase to complete the sentence.

The slope of segment AB is the slope of segment BC .

Part B

Use ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

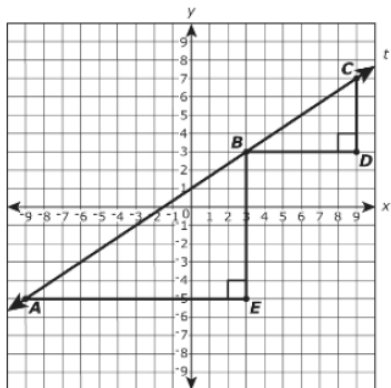
the ratio of triangle ABE is equal to $\frac{8}{12}$ when reduced is $\frac{2}{3}$. The ratio of triangle BCD is equal to $\frac{4}{6}$ when reduced is also $\frac{2}{3}$. This proves the slopes are equal.

Part C

Write an equation for line t . Show or explain how you determined your equation.

$$y = \frac{2}{3}x + 1$$

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .



Part A

Use the drop-down menu to complete the statement.

The slope of segment AB is the slope of segment BC .

Part B

Use ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

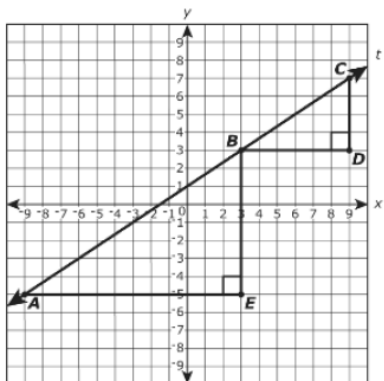
$$\begin{aligned} AB &= BD \\ EB &= CD \end{aligned}$$

Part C

Write an equation for line t . Show or explain how you determined your equation.

$$y = 3x - 2$$

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .



Part A

Use the drop-down menu to complete the statement.

The slope of segment AB is the slope of segment BC .

Part B

Use ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

the equation you use is $\frac{\text{rise}}{\text{run}}$
for triangle abe the equation is $\frac{8}{12}$
which reduces to $\frac{2}{3}$ and for triangle
 bcd it is $\frac{4}{6}$ which reduces to $\frac{2}{3}$.

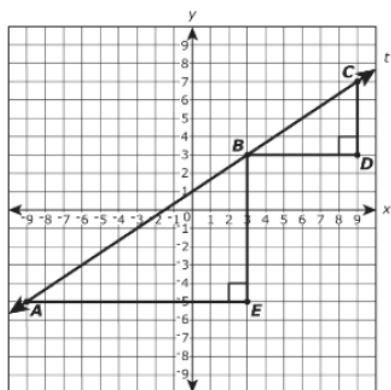
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Part C

Write an equation for line t . Show or explain how you determined your equation.

$$\frac{\text{rise}}{\text{run}} = \frac{12}{18} = \frac{2}{3}$$

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .



Part A

Use the drop-down menu to complete the statement.

The slope of segment AB is the slope of segment BC .

Part B

Use ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

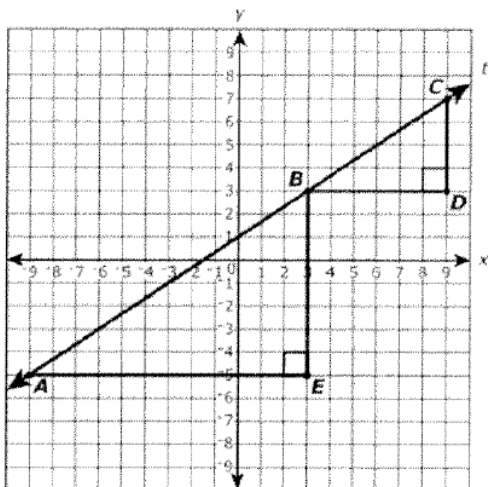
When you find the slope of AB you find the slope to be $\frac{2}{3}$. When you find the slope of BC it is also $\frac{2}{3}$ which means that both of the slopes are the same.

Part C

Write an equation for line t . Show or explain how you determined your equation.

$y = \frac{2}{3}x + 1$
 I found this equation by finding the slope of line t which is $\frac{2}{3}$ giving me $\frac{2}{3}x$. Then I found the y intercept of the line which is a positive one giving me the plus one. So n finding the slope of the line and the y intercept you can create the equation fo the line \square
 $y = \frac{2}{3}x + \square 1$

Similar triangles ABE and BCD are shown on the coordinate plane. Line t passes through points A , B , and C .



Part A

Choose the correct phrase to complete the sentence.

The slope of segment AB is the slope of segment BC .

Part B

Use ratios of the side lengths of triangle ABE and triangle BCD to explain your answer to Part A.

$$AB:BC \square = \square BE:CD \square = \square AE:BD$$

Part C

Write an equation for line t . Show or explain how you determined your equation.

$y = \frac{2}{3}x + 1$ The line intersects the y axis at 1, so that is the b value. It rises by two, and goes right by 3, so it has a slope of $\frac{2}{3}$.

Practice Set

Paper	Score
P101	1,1
P102	0,0
P103	1,0
P104	1,2
P105	0,2