

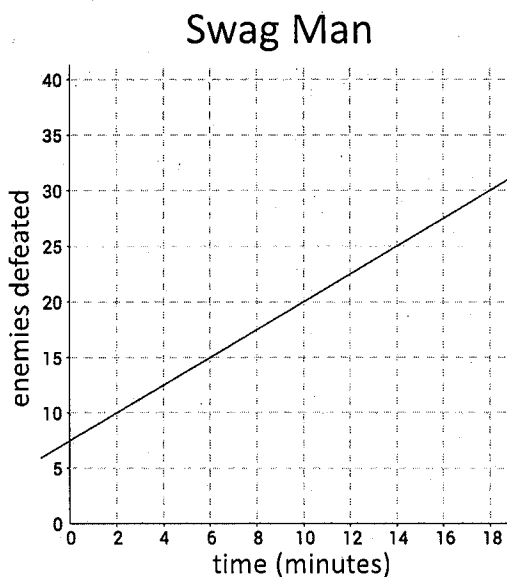
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## Comparing Functions: Swag Man vs. Agent Mustache

The following represents the number of enemies Swag Man and Agent Mustache are able to defeat as a function of time. Use the graph and the equation to answer the following questions.



**Agent Mustache**

$$e = 2t + 3$$

where  $e$  is number of enemies  
and  $t$  is time in minutes

1) Find the slope of Swag Man's graph and describe what it means in context of the story.

2) Find the slope of Agent Mustache's equation and describe it in context.

3) Compare the rates of change. Who has the greater rate of change? What does that mean in context of the situation?

4) When has Swag Man defeated more enemies? When has Agent Mustache defeated more? Explain how this can be possible using the concepts of slope and y-intercept.

5) When have both heroes defeated the same number of bad guys? Describe how you determined this.

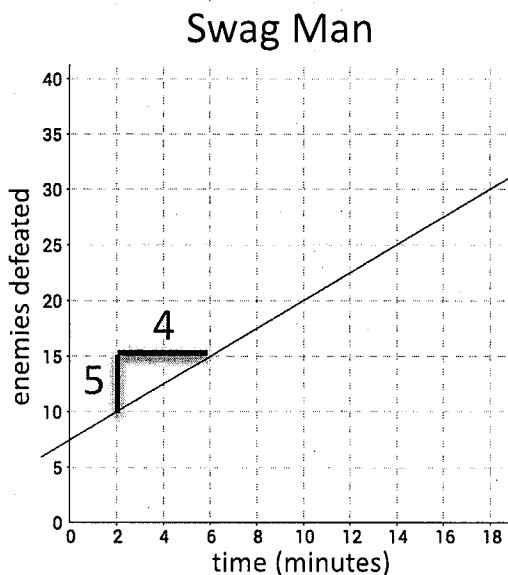
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**Agent Mustache**

$$e = 2t + 3$$

where  $e$  is number of enemies  
and  $t$  is time in minutes

- 1) Find the slope of Swag Man's graph and describe what it means in context of the story.

$$5/4 = 1.25$$

This means 5 enemies are defeated every 4 minutes or 1.25 enemies are defeated per minute.

- 2) Find the slope of Agent Mustache's equation and describe it in context.

The slope is 2, meaning Agent Mustache defeats 2 enemies every minute.

- 3) Compare the rates of change. Who has the greater rate of change? What does that mean in context of the situation?

Agent Mustache has a greater rate of change, meaning he defeats more enemies per minute.

- 4) When has Swag Man defeated more enemies? When has Agent Mustache defeated more? Explain how this can be possible using the concepts of slope and y-intercept.

At the beginning, Swag Man has defeated more enemies. This is because Swag Man starts off with already having defeated 7.5 enemies and Agent Mustache starts off with only 3. Agent Mustache has a greater rate of change, though, and after a while he catches up and eventually defeats more total enemies than Swag Man.

- 5) When have both heroes defeated the same number of bad guys? Describe how you determined this.

At 6 minutes, they have both defeated 15 enemies. Looking on the x-axis on the graph at 6 minutes, the line goes up to 15 enemies. Substituting 6 into the equation gives  $y = 2(6) + 3$  which equals 15 enemies.

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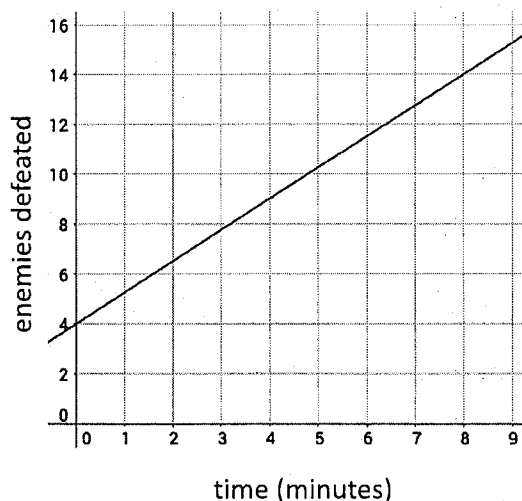
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## Comparing Functions: The Savage vs. The Ripped Reaper

The following represents the number of enemies that The Savage and The Ripped Reaper are able to defeat as a function of time. Use the graph and the equation to answer the following questions.

The Savage



The Ripped Reaper

time (min)	6	10	14	18	22
enemies defeated	13	15	17	19	21

1) Find the slope of The Savage's graph and describe what it means in context of the story.

2) Find the slope of The Ripped Reaper table and describe it in context.

3) Compare the rates of change. Who has the greater rate of change? What does that mean in context of the situation?

4) When has The Savage defeated more enemies? When has The Ripped Reaper defeated more? Explain how this can be possible using the concepts of slope and y-intercept.

5) When have both heroes defeated the same number of bad guys? Describe how you determined this.

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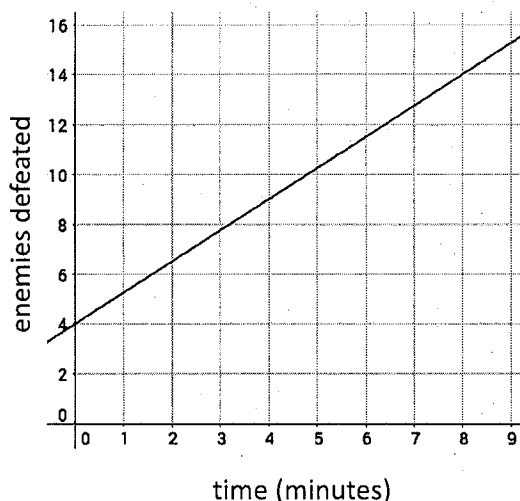
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## Comparing Functions: The Savage vs. The Ripped Reaper

The following represents the number of enemies that The Savage and The Ripped Reaper are able to defeat as a function of time. Use the graph and the equation to answer the following questions.

The Savage



The Ripped Reaper

time (min)	6	10	14	18	22
enemies defeated	13	15	17	19	21

- 1) Find the slope of The Savage's graph and describe what it means in context of the story.

The slope is  $\frac{5}{4}$ , meaning The Savage defeats 5 enemies every 4 minutes or 1.25 enemies a minute.

- 2) Find the slope of The Ripped Reaper table and describe it in context.

The slope is  $\frac{2}{4}$ , or  $\frac{1}{2}$ , meaning The Ripped Reaper defeats 2 enemies every 4 minutes or half an enemy per minute.

- 3) Compare the rates of change. Who has the greater rate of change? What does that mean in context of the situation?

The Savage's rate of change is greater since it is greater than 1 and The Ripped Reaper's rate of change is less than one. This means The Savage defeats enemies at a quicker pace. For that reason, I'd rather have The Savage on my side!

- 4) When has The Savage defeated more enemies? When has The Ripped Reaper defeated more? Explain how this can be possible using the concepts of slope and y-intercept.

The Savage has defeated more enemies after a certain amount of time has passed, since his slope, or rate, is greater, but his y-intercept, or starting point is less. It seems The Ripped Reaper has started this match having defeated more enemies. Maybe the The Savage gave him a head start. As a result, The Ripped Reaper has defeated more enemies at the beginning, with his head start.

- 5) When have both heroes defeated the same number of bad guys? Describe how you determined this. Using the expression  $\frac{5}{4}x + 4$  for The Savage and  $\frac{1}{2}x + 10$  for The Ripped Reaper, I set them equal and solved for  $x$ . After subtracting  $\frac{1}{2}x$  on both sides and subtracting 4 on both sides, I got  $\frac{3}{4}x = 6$ . I then multiplied both sides by 4 and divided by 3 to get  $x = 8$ . After 8 minutes, both have defeated 14 enemies.