

Additional Blackline Master 20  
Speed-Time Graphs for Acceleration

**Acceleration of a Skater**

Area =  $\frac{1}{2}bh$   
 $= \frac{1}{2}(4)(8)$   
 $= 16m$

**Acceleration of a Snowboarder**

Area 1 =  $\frac{1}{2}bh = \frac{1}{2}(8)(15) = 60m$

Area 2 =  $\frac{1}{2}bh = \frac{1}{2}(3)(3) = 4.5m$

Total dist =  $48 + 24 = 72m$

Follow these steps to find the slope of a graph:

- Pick any two points on the line.
- Name them points 1 and 2 such that the point further to the right is called point 2.
- Write down the x and y values of each point in the form of  $(x_1, y_1)$  and  $(x_2, y_2)$ . For example, the point circled on the graph has the values (3, 6).
- Calculate the slope by substituting the values of the points into the equation (slope =  $\frac{y_2 - y_1}{x_2 - x_1}$ ) and solving.

**Practice**

Follow the steps outlined above to find the slope of the line and thus the acceleration of the snowboarder.

Step 1. Circle any two points on the graph at the set.

Step 2. Label the point to the left "point 1," and the point to the right "point 2."

Step 3. Write down the x- and y-values for each point.  
 Point 1  $(x_1, y_1)$  Point 2  $(x_2, y_2)$   
 0, 3     8, 15

Step 4. Calculate the slope.  
 slope =  $\frac{y_2 - y_1}{x_2 - x_1}$   
 $\frac{15 - 3}{8 - 0} = \frac{12}{8} = 1.5 \text{ m/s}^2$

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