Slope

$$y = mx + b$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{rise}{run}$$

Where's the slope?
Where's the slope?
Rise over run.
Rise over run.
Difference of the y's
Over difference of the x's
Simplify.
That's the slope.

Example 1 Use slope to describe a line

The line **RISES** from left to right when the slope is _____.
The line **FALLS** from left to right when the slope is _____.
The line is **HORIZONTAL** when the slope is _____.
The line is **VERTICAL** when the slope is _____.

A] (1, 1), (3, -5)

B] (2,4), (2,9)

C] (-5,2), (5,2)

D] $2(3-y) = 4-12x$

E] $2x-3y=-15$

F] $5-3y=2y-15$

Example 2 Comparing steepness of lines

Compare the absolute value of each slope.
The greater the slope, the steeper the line.

A] Line 1 (1, -12), (-4, 8)	B] Line 1 $y = -\frac{4}{7}x + 10$	C] Line 1 $x + 4y = -28$
Line 2 (-1, 5), (2, -4)	Line 2 $y = \frac{5}{9}x - 12$	Line 2 $x - 2y = -16$

Example 3 Parallel and perpendicular lines

Parallel lines have the same slope but different y-intercept.
Perpendicular lines have opposite reciprocal slopes.
Coinciding lines have the same slope and the same y-intercept.

A] Line 1 $6x - 2y = 10$	B] Line 1 $y = \frac{1}{2}x + 3$	C] Line 1 (8, -4), (3, 5)
Line 2 $3x - y = -5$	Line 2 $y = -2x + 3$	Line 2 (-4, -2), (1, 7)

Example 4 Slope as rate of change

You started driving at 10 am with 2,500 miles on the odometer. When you stopped to get gas at 3 pm the odometer read 2,810 miles. What was your average speed (in mph) while you were driving?