

- 1) Find the slope of the line PQ that contains points $P(3, -5)$ and $Q(0, -3)$ and the slope of any line perpendicular to this line. Note: The symbol \perp means perpendicular, so m_{\perp} would represent the slope of the perpendicular line.

A $m = -\frac{3}{2}, m_{\perp} = \frac{2}{3}$

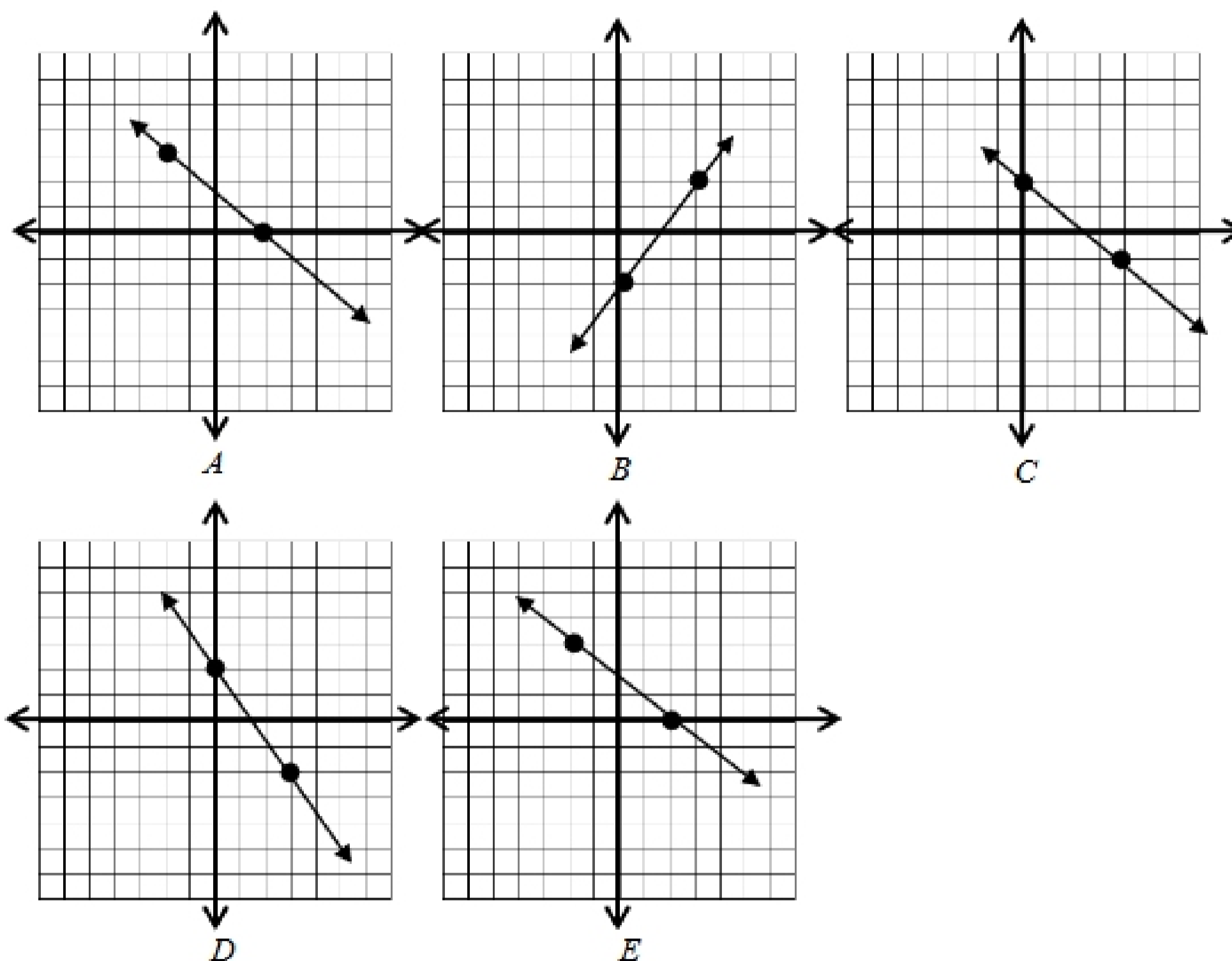
B $m = -\frac{2}{3}, m_{\perp} = \frac{3}{2}$

C $m = -\frac{2}{3}, m_{\perp} = -\frac{3}{2}$

D $m = -\frac{3}{2}, m_{\perp} = -\frac{2}{3}$

E $m = \frac{2}{3}, m_{\perp} = -\frac{3}{2}$

- 2) Which is the graph of the line with equation $y = -\frac{3}{4}x + 2$? Each axis uses a scale of one unit per hash mark and each axis is drawn boldly.



- 3) Find the equation in general form for the line through points (2, 5) and (8, 2).
- A $2x + y - 9 = 0$
B $x - 2y + 8 = 0$
C $x - 2y + 9 = 0$
D $x + 2y - 8 = 0$
E $x + 2y - 12 = 0$
- 4) In 2000, 23% of Americans regularly used online news as their source of information and this has been increasing at an average rate of 1.4% per year since then. Write a linear function in slope-intercept form where t represents number of years since 2000 to represent the percent of Americans who regularly use online news sources. Use your equation to find in how many years 52.4% of Americans regularly use online news sources. Which choice describes this?
- A Between 18.5 and 20.5 years
B Between 20.5 and 22.5 years
C Between 16.5 and 18.5 years
D Between 22.5 and 24.5 years
E None of the above.
- 5) The number of houses H in a housing development that can be served by a water pipe **varies directly** as the square of the diameter of the pipe. A 30 centimeter diameter pipe can service 90 houses. What size diameter can service 160 houses? Which statement describes the diameter of the water pipe?
- A The diameter of the water pipe is at least 38 cm, but less than 44 cm.
B The diameter of the water pipe is at least 48 cm, but less than 53 cm.
C The diameter of the water pipe is at least 32 cm, but less than 38 cm.
D The diameter of the water pipe is at least 53 cm, but less than 60 cm.
E The diameter of the water pipe is at least 60 cm, but less than 67 cm.
- 6) If $f(x) = 2x - 3$ and $g(x) = \frac{5}{x+2}$, find and simplify $(g \circ f)(x)$.
- A $(g \circ f)(x) = \frac{4-3x}{x+2}$
B $(g \circ f)(x) = \frac{5(2x-3)}{x+2}$
C $(g \circ f)(x) = \frac{5}{2(x^2-3x+1)}$
D $(g \circ f)(x) = \frac{5}{(2x-3)(x+2)}$
E $(g \circ f)(x) = \frac{5}{2x-1}$

7) The function $f(x) = \frac{8}{x} - 2$ is a one-to-one function. Find its inverse, $f^{-1}(x)$.

A $f^{-1}(x) = \frac{8}{x-2}$

B $f^{-1}(x) = \frac{8}{x+2}$

C $f^{-1}(x) = \frac{8}{x} + 2$

D $f^{-1}(x) = \frac{x}{8} - 2$

E $f^{-1}(x) = \frac{x}{8-2x}$

8) Find the accumulated value of an investment of \$5000 for $3\frac{1}{2}$ years at 4% annual interest compounded quarterly. Round to the nearest dollar.

A \$5634

B \$5014

C \$5736

D \$5743

E \$5747

9) The **function f below** models the percentage of first-year college men who agreed with the statement, 'The activities of married women are best confined to the home and family' for x years after 1969. For the year 1999, which statement best describes the percentage (rounded to the nearest tenth) of first-year college men who agreed with the statement?

$$f(x) = -7.49 \ln x + 53$$

A The percentage of men who agreed with the statement is approximately 41.9%.

B The percentage of men who agreed with the statement is approximately 27.8%.

C The percentage of men who agreed with the statement is approximately 33.3%.

D The percentage of men who agreed with the statement is approximately 27.5%.

E The percentage of men who agreed with the statement is approximately 48.9%.