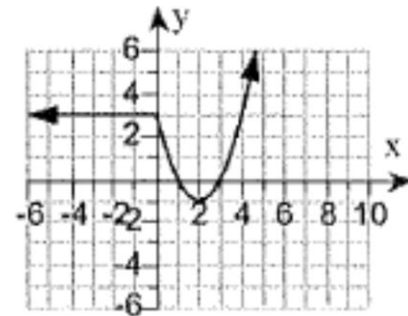


1) Examine the graph of the function. Which statement(s) is(are) true?

- I The range of the function is $[-1, \infty)$.
- II There is an x -intercept of 3.
- III The function is increasing on $[2, \infty)$.
- IV There is a relative minimum value of -1.



- A II and III only
- B I, II, III, and IV
- C I, II, and IV only
- D II, III, and IV only
- E II and IV only

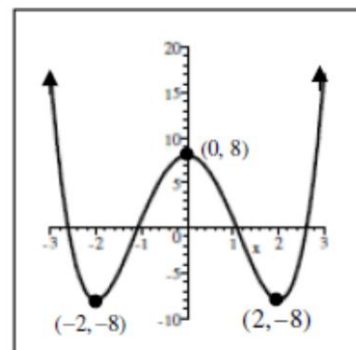
2) A function f is defined below. Find the function values $f(-2)$ and $f(4)$.

$$f(x) = \begin{cases} x-3 & \text{if } x < -2 \\ x^2 & \text{if } -2 \leq x < 4 \\ |1-x| & \text{if } x \geq 4 \end{cases}$$

- A $f(-2) = -5, \quad f(4) = 16$
- B $f(-2) = -4, \quad f(4) = 3$
- C $f(-2) = 4, \quad f(4) = 16$
- D $f(-2) = 4, \quad f(4) = 3$
- E $f(-2) = -5, \quad f(4) = 3$

3) Which statement about the function graphed below is **false**?

- A The function is increasing on $(-8, 8)$.
- B There is a relative minimum at $x = 2$.
- C The function is 'even'.
- D The range of the function is $[-8, \infty)$.
- E There is a relative maximum value of 8.



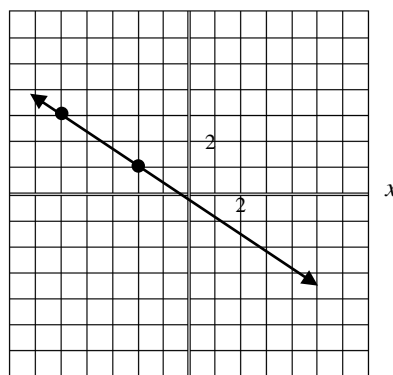
$f(x)$

4) What are the slope and the y -intercept of the line with equation $6x - 11y - 5 = 0$?

- A slope: $-\frac{6}{11}$, y -intercept: $\frac{5}{11}$
 B slope: $-\frac{11}{6}$, y -intercept: $-\frac{11}{5}$
 C slope: $\frac{6}{11}$, y -intercept: $-\frac{5}{11}$
 D slope: $\frac{6}{11}$, y -intercept: 5
 E None of the above.

5) The graph shown represents which equation?

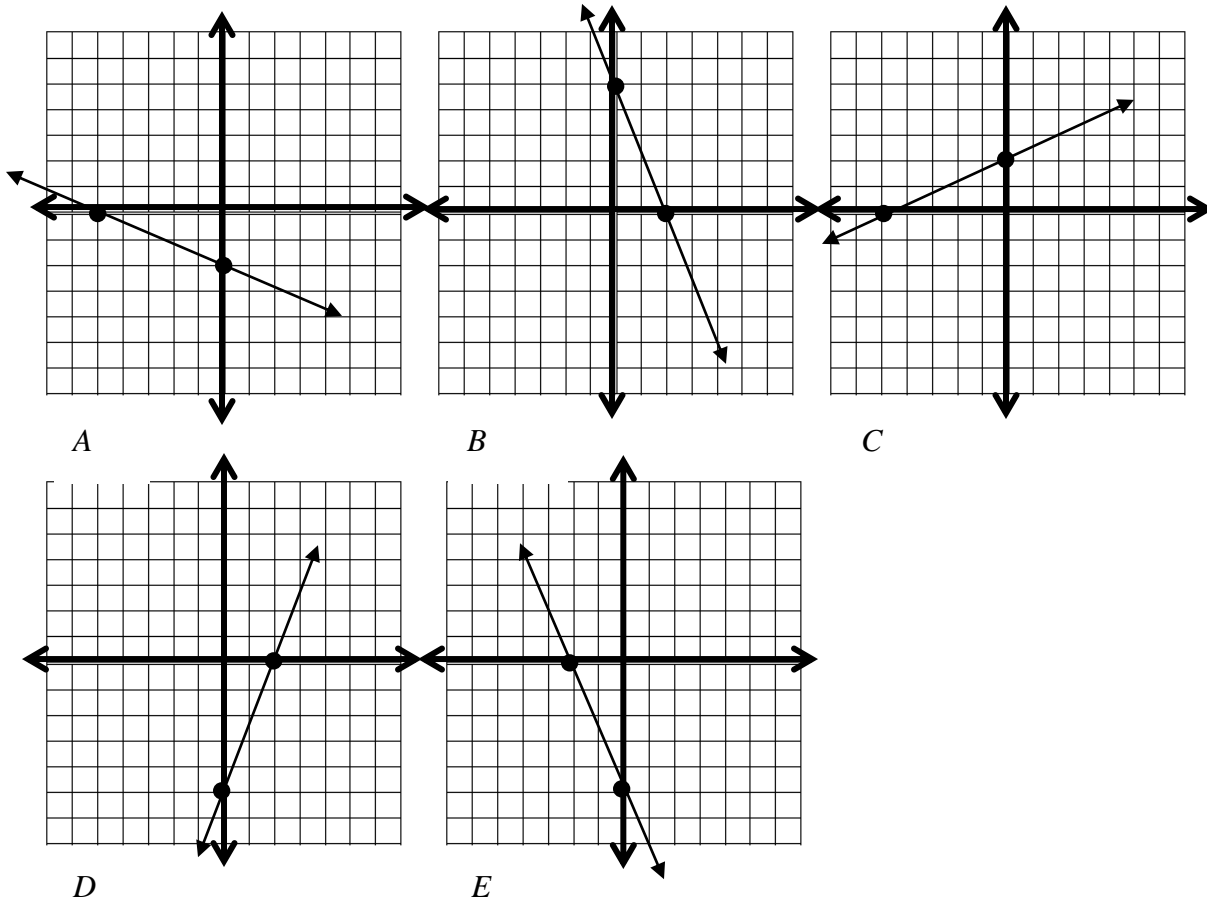
- A $y = \frac{2}{3}x + \frac{19}{3}$
 B $y = -\frac{2}{3}x - \frac{1}{3}$
 C $y = -\frac{3}{2}x - \frac{9}{2}$
 D $y = -\frac{2}{3}x - \frac{1}{6}$
 E $y = -\frac{3}{2}x - \frac{1}{2}$



6) Which equation represents a line through $(0, -2)$ and parallel to the line $5x - 3y = 15$?

- A $y = \frac{3}{5}x - 5$
 B $y = \frac{5}{3}x - 2$
 C $y = \frac{5}{3}x + 15$
 D $y = -\frac{5}{3}x - 2$
 E $y = \frac{3}{5}x - 2$

- 7) Find the x -intercept and the y -intercept of the line with equation $5x - 2y = 10$. Use the intercepts to decide which choice is the correct graph of the line. The axes are in bold print and the scale on each is 1 unit per hash mark.



- 8) y varies directly as x and inversely as z . When $x = 12$ and $z = 9$, then $y = 4$. Find the variation equation. Then use your equation to solve for y when $x = 11$ and $z = 2$.

- A $y = 66$
- B $y = 3$
- C $y = \frac{33}{2}$
- D $y = \frac{22}{9}$
- E $y = \frac{52}{21}$

- 9) Which correctly pair a function with its domain?

I	$f(x) = \sqrt{2-x}$	Domain: $(-\infty, 2]$
II	$g(x) = \frac{x}{x+3}$	Domain: $(-\infty, -3) \cup (-3, 0) \cup (0, \infty)$
III	$h(x) = 4x - 2x^2$	Domain: $(-\infty, \infty)$

- A I and III only
B I only
C II and III only
D I and II only
E I, II, and III
- 10) Which choice represents a pair of inverse functions?

- A $f(x) = \frac{x+2}{4}$ and $g(x) = 4x - 2$
B $f(x) = \frac{1}{x-5}$ and $g(x) = x + 5$
C $f(x) = \frac{2}{x-1}$ and $g(x) = \frac{x-1}{2}$
D $f(x) = \sqrt{x+2}$ ($x \geq -1$) and $g(x) = (x-2)^2$
E $f(x) = \frac{1}{x+2}$ and $g(x) = 2 + \frac{1}{x}$

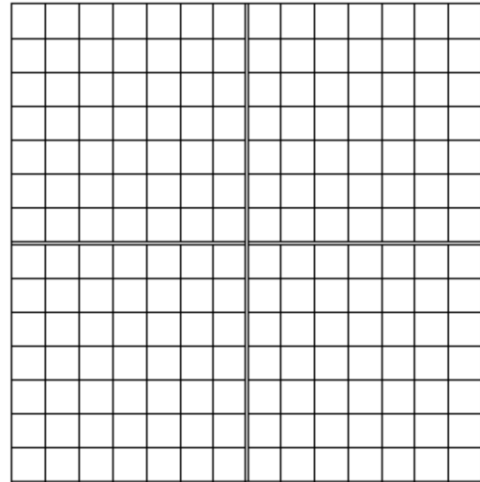
- 11) Lisa opened a savings account at Farm Life Bank and deposited \$575 initially. (She made no additional deposits.) If the account earns 2.2% annual interest compounded quarterly, how much had accumulated in the account at the end of 3 ½ years? Round to the nearest cent. (See the formulas on the cover sheet.)

- A \$621.02
B \$620.76
C \$620.89
D \$620.98
E \$620.51

- 12) Which statement is **false** concerning the graph of the function $f(x) = \left(\frac{1}{3}\right)^x$?

A place is provided for you to graph the function, if you wish.

- A The graph will approach, but not touch or cross the x -axis (x -axis is an asymptote).
 B The graph will represent an increasing function.
 C The range of the graph is $(0, \infty)$.
 D The point $(-2, 9)$ is on the graph.
 E The y -intercept is 1.



- 13) Use the properties of exponents to condense the logarithmic expression below. (Write the expression as a single logarithm whose coefficient is 1. Assume the value of x is positive.)

$$2\log x + 3\log 2 - \frac{1}{2}\log(x+1)$$

- A $\frac{(\log x^2)(\log 8)}{\log(\sqrt{x+1})}$
 B $\log\left(\frac{6x^2}{\sqrt{x+1}}\right)$
 C $\frac{\log(8x^2)}{\log(\sqrt{x+1})}$
 D $\log\left(\frac{8x^2}{\sqrt{x+1}}\right)$
 E $\log\left(\frac{2x\sqrt{2}}{\sqrt{x+1}}\right)$

14) Solve this equation for x : $\log x + \log(x - 21) = 2$

- A $x = \frac{21}{2} + \frac{\sqrt{449}}{2}$
- B $x = \frac{23}{2}$
- C $x = -4$ and $x = 25$
- D No solution
- E $x = 25$

15) The amount of radioactive material present in t years is given by $A = A_0 2^{-\left(\frac{t}{h}\right)}$, where A_0 is the amount present initially at time $t = 0$ and h is the material's half-life. Suppose 10 pounds of radioactive cesium-137 is released into a small area. If the half-life of this element is 30.2 years, which choice gives a description of how much will remain in the area after 50 years?

- A Between 0 and 3 pounds
- B Between 3 and 3.5 pounds
- C Between 3.5 and 4 pounds
- D Between 4 and 4.5 pounds
- E Greater than 4.5 pounds