

The following multiple choice questions are worth 5 points each.

1. Solve for x : $\frac{2x-1}{3} - \frac{x-5}{6} = \frac{x-3}{4}$

a. $x = 1$

c. $x = \frac{5}{3}$

b. $x = -5$

d. no solution

2. Solve for x : $2(1-4x) + 3(5-2x) < 7x$

a. $x > \frac{17}{21}$

c. $x > -\frac{21}{17}$

b. $x < \frac{17}{21}$

d. $x < -\frac{17}{21}$

3. Which of the following relations are functions?

I. $\{(5, 1), (1, 5), (7, 3), (3, 7)\}$

II. $\{(8, 0), (5, 4), (9, 3), (0, 8)\}$

III. $\{(1, 2), (1, 3), (1, 4), (1, 5)\}$

IV. $\{(2, 1), (3, 1), (4, 1), (5, 1)\}$

a. I, III, IV

c. I, II, IV

b. II, III

d. I, IV

4. Find the equation of the line passing through the point $(3, -2)$ and perpendicular to the line $3x + 2y = 6$.

a. $y = \frac{2}{3}x$

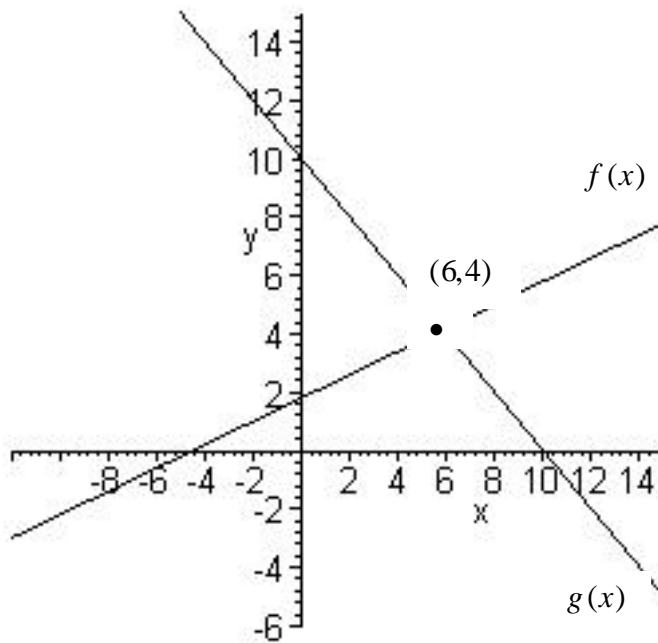
c. $y = \frac{2}{3}x - 4$

b. $y = -\frac{2}{3}x$

d. $y = -\frac{3}{2}x + \frac{5}{2}$

e. $y = \frac{3}{2}x - \frac{13}{2}$

5. Consider the following figure. Solve: $f(x) < g(x)$



a. $(4, 6)$

c. $(4, \infty)$

b. $(-\infty, 6)$

d. $(6, \infty)$

6. Solve $\frac{2}{x+p} = \frac{3}{q}$ for x

a. $x = \frac{2q-3p}{3}$

c. $x = 2q - p$

b. $x = \frac{2q}{3+p}$

d. $x = \frac{6}{q} - p$

7. An area rug is 3 feet longer than its width. What is its length if the perimeter of the rug is 26 feet?

a. 5 feet

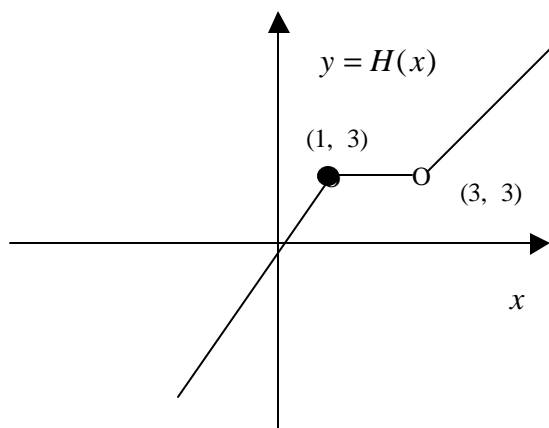
c. 13 feet

b. 7 feet

d. 8 feet

e. 10 feet

8. Consider the graph of the function, $H(x)$ below.



- I. The domain of $H(x)$ is $(-\infty, \infty)$.
- II. $H(x)$ is increasing over its entire domain.
- III. The range of $H(x)$ is $[3, \infty)$.

- a. Only I is correct
- b. Only I and II are correct

- c. Only I and III are correct
- d. I, II and III are all incorrect.

9. Consider the functions $f(x) = x^2$ and $g(x) = f(x+2) - 3$

The function $g(x)$ is obtained from $f(x)$ by

- a. shifting $f(x)$ to the left 2 units and 3 units downward
- b. shifting $f(x)$ 2 units upward and 3 units to the right
- c. reflecting $f(x)$ through the origin
- d. reflecting $f(x)$ through x -axis, shifting $f(x)$ 2 units to the right and downward 3 units.

10. Let $f(x) = 3x + 2$ and $g(x) = 5x$

$$(f \circ g)(x) = f[g(x)] =$$

- a. $15x^2 + 10x$
- b. $8x + 2$
- c. $15x + 10$
- d. $15x + 2$

11. The following tables give some selected ordered pairs for function f, g, h .

x	3	4	6
$f(x)$	1	3	9

x	2	7	1	9	0
$g(x)$	3	6	9	1	2

x	9	10	12
$h(x)$	0	1	8

Find $h(f(g(7)))$

- a. 0
- b. 8
- c. 1
- d. 3

12. Find the difference quotient,

$$\frac{f(x+h) - f(x)}{h} \quad (h \neq 0) \quad \text{for} \quad f(x) = x^2 - 5x + 3$$

- a. $3x + h - 5$
- b. $2x + h - 5$
- c. $3x + 2h - 3$
- d. $2x + 5h + 3$

13. Solve the inequality:

$$x^2 + 6x + 8 > 0$$

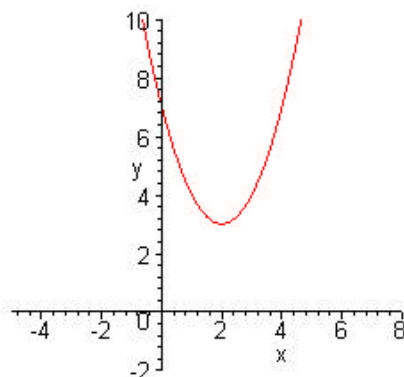
a. $(-\infty, -4)$

c. $(-4, -2)$

b. $(-2, \infty)$

d. $(-\infty, -4) \cup (-2, \infty)$

14. The figure below shows the graph of $f(x) = ax^2 + bx + c$:



Which of the following statements is correct?

a. $a < 0, b^2 - 4ac = 0$

c. $a > 0, b^2 - 4ac = 0$

b. $a < 0, b^2 - 4ac > 0$

d. $a > 0, b^2 - 4ac < 0$

16. Find the equation of the quadratic function with vertex $(5, 6)$ that goes through $(1, -6)$.

17. Graph the following function:

$$f(x) = \begin{cases} 2x+1 & \text{if } x < -1 \\ x+2 & \text{if } x \geq -1 \end{cases}$$

