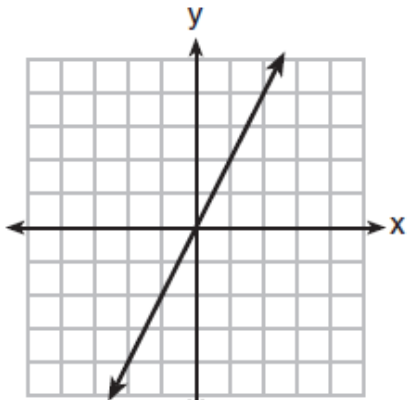
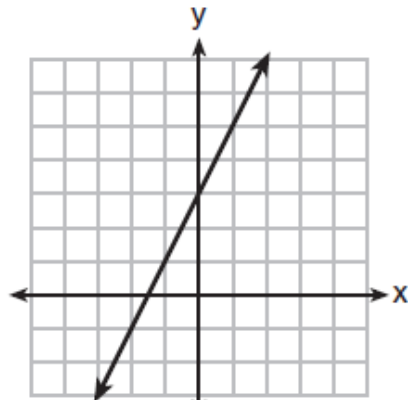


Question 1.

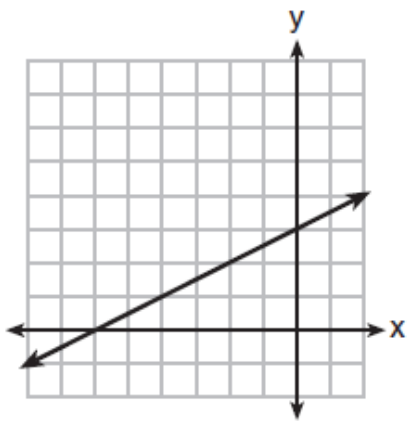
Which graph shows a line where each value of y is three more than half of x ?



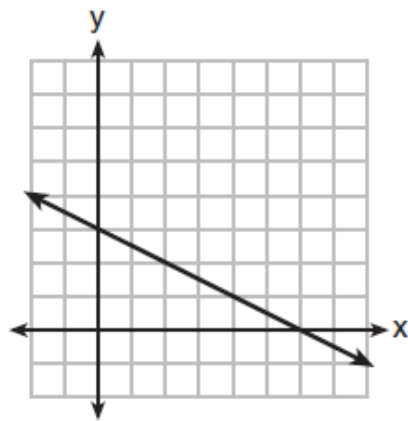
(1)



(3)



(2)



(4)

Question 2

The table below shows the average diameter of a pupil in a person's eye as he or she grows older.

Age (years)	Average Pupil Diameter (mm)
20	4.7
30	4.3
40	3.9
50	3.5
60	3.1
70	2.7
80	2.3

What is the average rate of change, in millimeters per year, of a person's pupil diameter from age 20 to age 80?

- (1) 2.4 (3) -2.4
(2) 0.04 (4) -0.04

Question 3.

Which expression is equivalent to $x^4 - 12x^2 + 36$?

- (1) $(x^2 - 6)(x^2 - 6)$ (3) $(6 - x^2)(6 + x^2)$
(2) $(x^2 + 6)(x^2 + 6)$ (4) $(x^2 + 6)(x^2 - 6)$

Question 4.

The third term in an arithmetic sequence is 10 and the fifth term is 26. If the first term is a_1 , which is an equation for the n th term of this sequence?

(1) $a_n = 8n + 10$

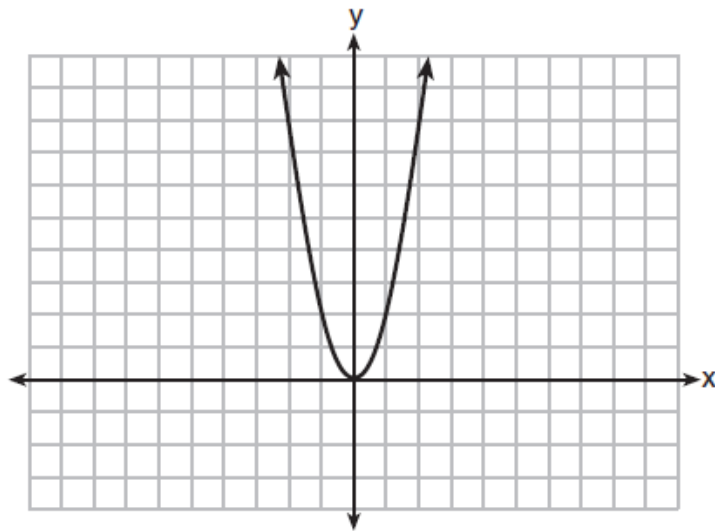
(3) $a_n = 16n + 10$

(2) $a_n = 8n - 14$

(4) $a_n = 16n - 38$

Question 5.

The graph of the equation $y = ax^2$ is shown below.



If a is multiplied by $-\frac{1}{2}$, the graph of the new equation is

(1) wider and opens downward

(2) wider and opens upward

(3) narrower and opens downward

(4) narrower and opens upward

Question 6.

The zeros of the function $f(x) = (x + 2)^2 - 25$ are

- (1) -2 and 5
- (2) -3 and 7
- (3) -5 and 2
- (4) -7 and 3

Question 7.

During the 2010 season, football player McGee's earnings, m , were 0.005 million dollars more than those of his teammate Fitzpatrick's earnings, f . The two players earned a total of 3.95 million dollars. Which system of equations could be used to determine the amount each player earned, in millions of dollars?

- (1) $m + f = 3.95$
 $m + 0.005 = f$
- (2) $m - 3.95 = f$
 $f + 0.005 = m$
- (3) $f - 3.95 = m$
 $m + 0.005 = f$
- (4) $m + f = 3.95$
 $f + 0.005 = m$

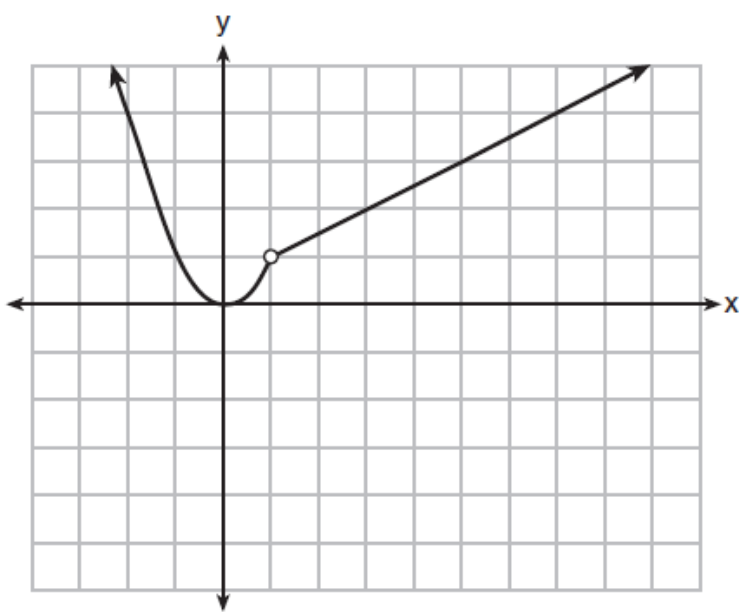
Question 8.

What is the value of x in the equation $\frac{x-2}{3} + \frac{1}{6} = \frac{5}{6}$?

- (1) 4
- (2) 6
- (3) 8
- (4) 11

Question 9.

A function is graphed on the set of axes below.



Which function is related to the graph?

- (1) $f(x) = \begin{cases} x^2, & x < 1 \\ x - 2, & x > 1 \end{cases}$ (3) $f(x) = \begin{cases} x^2, & x < 1 \\ 2x - 7, & x > 1 \end{cases}$
- (2) $f(x) = \begin{cases} x^2, & x < 1 \\ \frac{1}{2}x + \frac{1}{2}, & x > 1 \end{cases}$ (4) $f(x) = \begin{cases} x^2, & x < 1 \\ \frac{3}{2}x - \frac{9}{2}, & x > 1 \end{cases}$

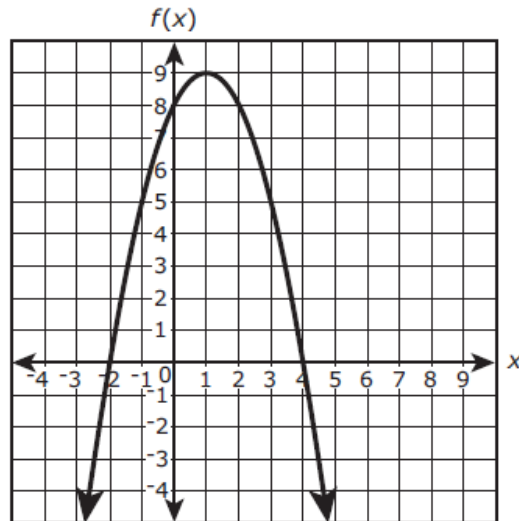
Question 10.

The function $h(t) = -16t^2 + 144$ represents the height, $h(t)$, in feet, of an object from the ground at t seconds after it is dropped. A realistic domain for this function is

- (1) $-3 \leq t \leq 3$ (3) $0 \leq h(t) \leq 144$
(2) $0 \leq t \leq 3$ (4) all real numbers

Bonus Question
Question 11

The figure shows a graph of the function of $f(x)$ in the xy -coordinate plane, with the vertex at $(1, 9)$ and the zeros at -2 and 4 .



The function g is defined by $g(x) = -3x + 2$.

Which statements are true? Select **all** that apply.

- Ⓐ $f(-2)$ is greater than $g(-2)$.
- Ⓑ $f(-1)$ is less than $g(-1)$.
- Ⓒ $f(0)$ is greater than $g(0)$.
- Ⓓ $f(1)$ is less than $g(1)$.
- Ⓔ $f(2)$ is greater than $g(2)$.