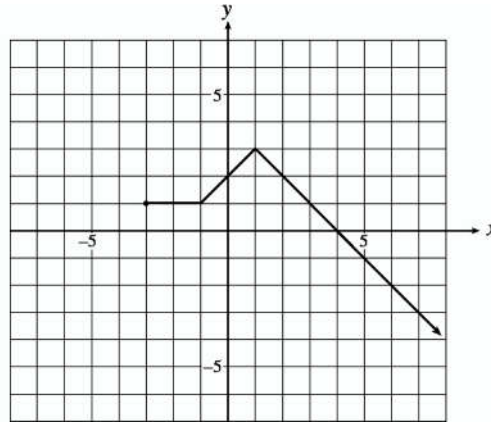


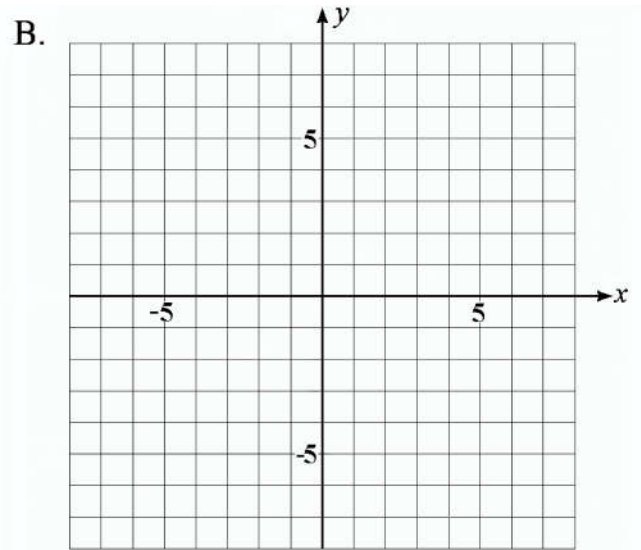
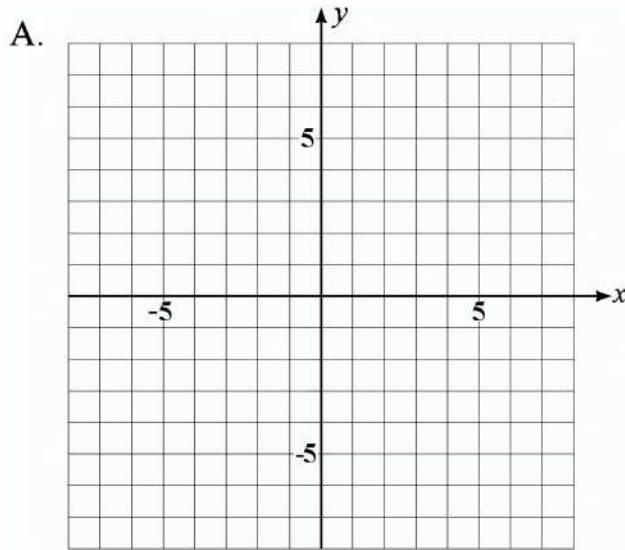
43. The graph of  $y = f(x)$  is shown below.



On the grids provided, sketch the graphs of:

A.  $y = f(-x) - 3$

B.  $y = \frac{1}{f(x)}$



**AUG 2005**

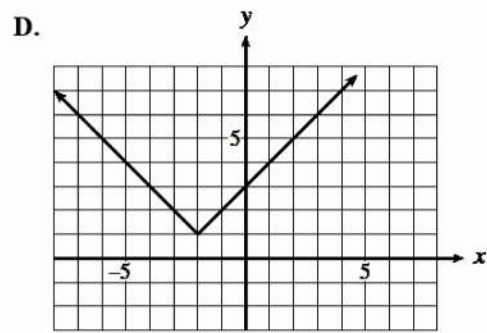
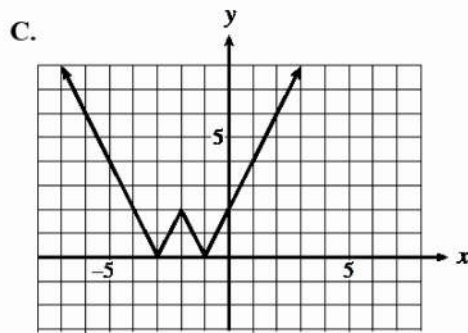
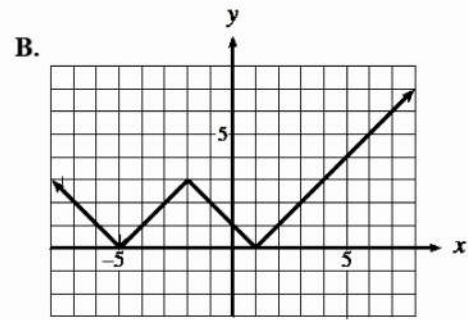
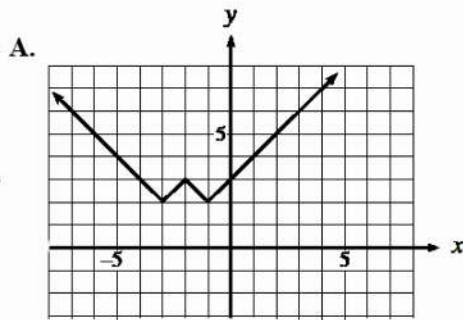
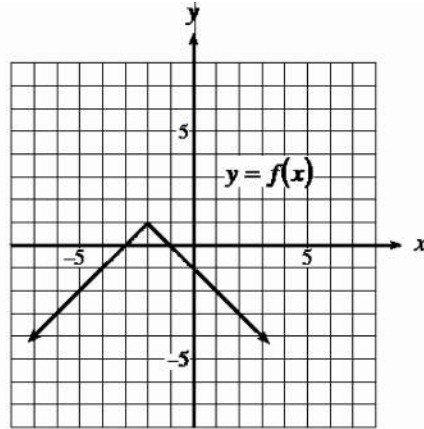
44. If the function  $y = 3^x$  is expanded vertically by a factor of 9 to produce a new function, which of the following is an equation of the new function?

- A.  $y = 3^{2x}$       B.  $y = 3^{3x}$       C.  $y = 3^{x+2}$       D.  $y = 3^{x-2}$

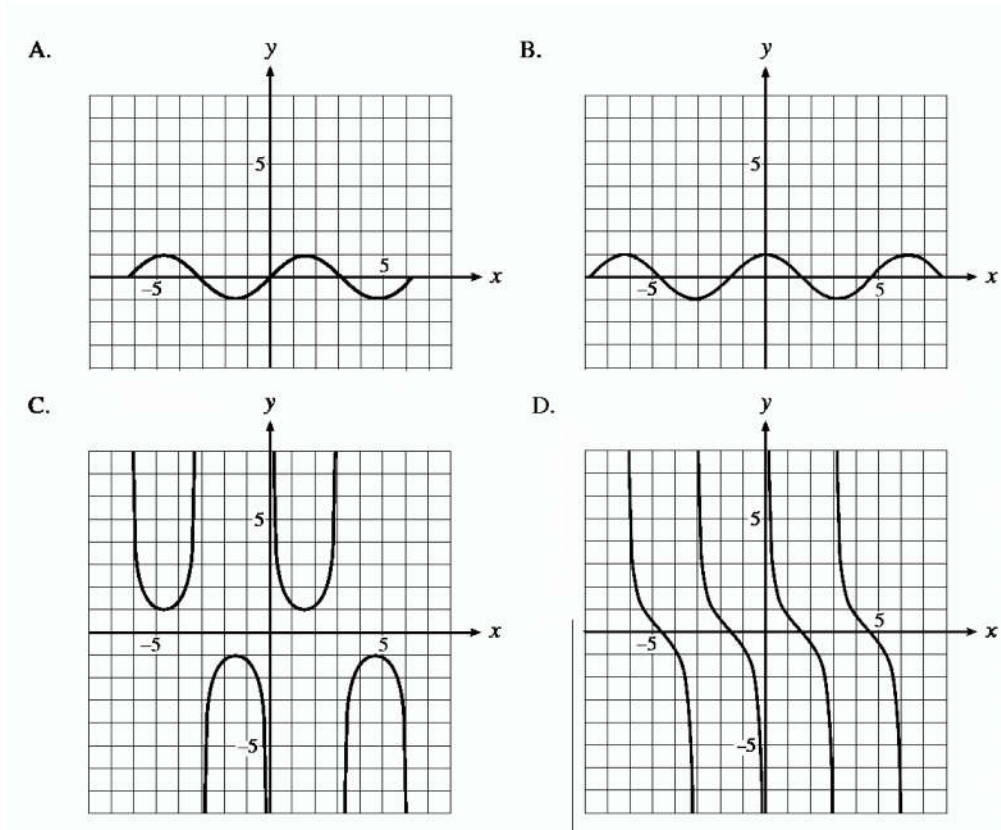
45. Which equation represents the graph of  $y = g(x)$  after it is translated 3 units to the right?

- A.  $y = g(x) + 3$       B.  $y = g(x) - 3$       C.  $y = g(x + 3)$       D.  $y = g(x - 3)$

46. The graph of  $y = f(x)$  is shown below. Which graph represents  $y = |f(x)| + 2$ ?



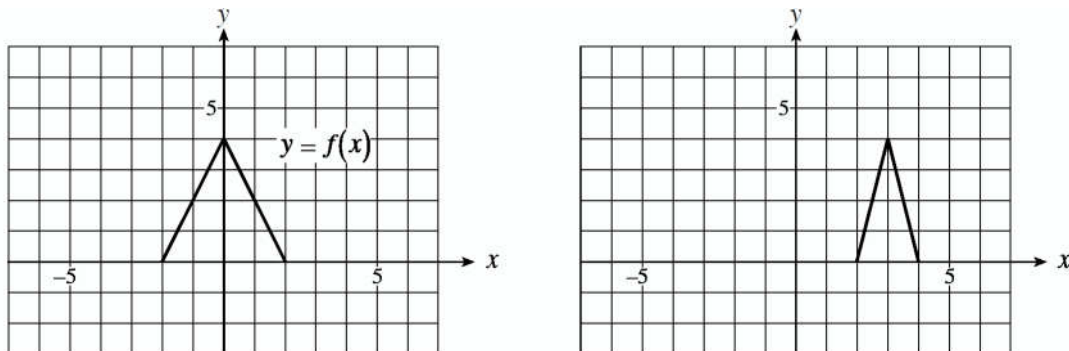
47. For which of the following functions is  $f(-x) = f(x)$  ?



48. If the point  $(6, 10)$  is on the graph of  $y = f(x)$ , which point must be on the graph of  $y = \frac{1}{2f(x)}$  ?

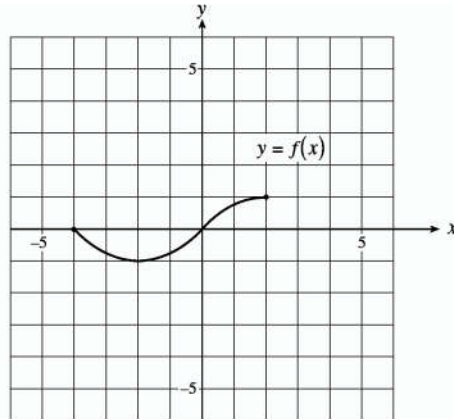
- A.  $(3, \frac{1}{10})$       B.  $(6, \frac{1}{5})$       C.  $(6, \frac{1}{10})$       D.  $(6, \frac{1}{20})$

49. Given the graph of the function  $y = f(x)$  on the left, determine the equation of the function on the right.



- A.  $y = f\left(\frac{x}{2} - 3\right)$       B.  $y = f\left(\frac{x-3}{2}\right)$       C.  $y = f(2x - 3)$       D.  $y = f(2x - 6)$

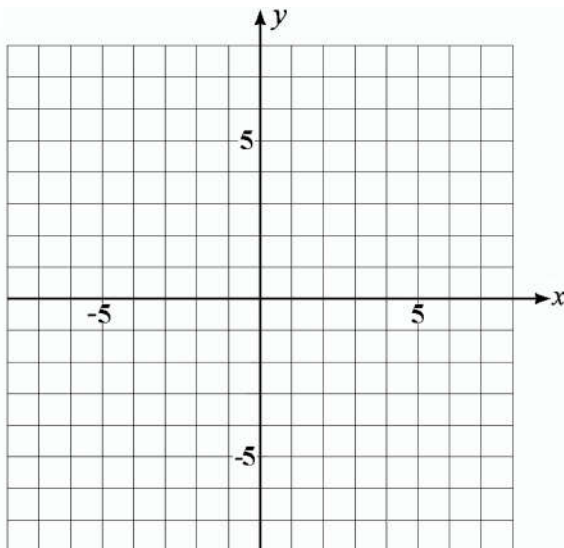
50. The graph of  $y = f(x)$  is shown below. On the grids provided, sketch the graphs of



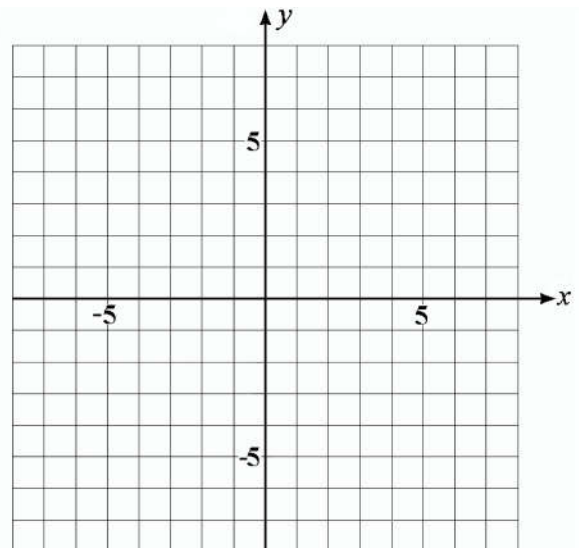
A.  $y = 3f(x) + 1$

B.  $y = \frac{1}{f(x)}$

A.



B.



51. Which equation represents the graph of  $\frac{(x-2)^2}{4} + \frac{(y-3)^2}{9} = 1$  after it is translated 5 units to the right and 1 unit up?

A.  $\frac{(x-7)^2}{4} + \frac{(y-4)^2}{9} = 1$

B.  $\frac{(x-7)^2}{4} + \frac{(y-2)^2}{9} = 1$

C.  $\frac{(x+3)^2}{4} + \frac{(y-4)^2}{9} = 1$

D.  $\frac{(x+3)^2}{4} + \frac{(y-2)^2}{9} = 1$

52. Which equation represents the graph of  $y = 2^x$  after it is reflected in the  $x$ -axis?

A.  $y = 2^{-x}$

B.  $y = -2^x$

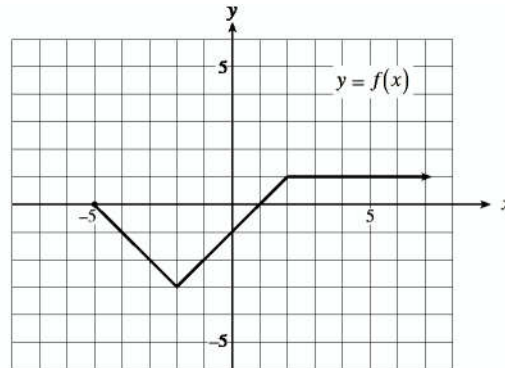
C.  $y = \log_2 x$

D.  $y = -\log_2 x$

AUG 2006

53. How is the graph of  $y = f(4x)$  related to the graph of  $y = f(x)$ ?
- A.  $y = f(x)$  has been compressed vertically by a factor of 4.
  - B.  $y = f(x)$  has been compressed horizontally by a factor of 4.
  - C.  $y = f(x)$  has been expanded vertically by a factor of 4.
  - D.  $y = f(x)$  has been expanded horizontally by a factor of 4.
54. If the maximum value of the function  $y = f(x)$  is 6, determine the maximum value of  $y = \frac{1}{3}f\left(\frac{1}{2}x\right)$ .
- A. 2
  - B. 3
  - C. 12
  - D. 18
55. If the point  $(-2, -5)$  is on the graph of  $y = f(x)$ , which point must be on the graph of  $y = |f(x - 1)| - 3$ ?
- A.  $(-3, 2)$
  - B.  $(-1, 2)$
  - C.  $(1, -8)$
  - D.  $(3, -8)$

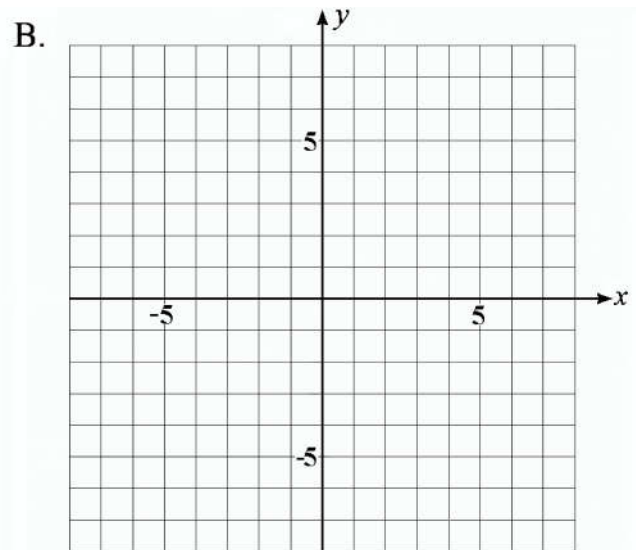
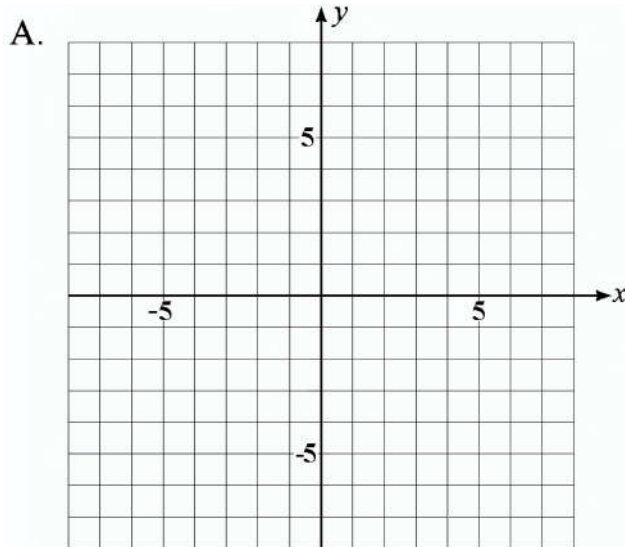
56. The graph of  $y = f(x)$  is shown below.



On the grids provided, sketch the graphs of:

A.  $y = 2|f(x)| + 1$

B.  $y = \frac{1}{f(x)}$



**SAMPLE 2008**

57. Which equation represents the graph of  $y = f(x)$  after it is vertically compressed by a factor of 2 and then translated 2 units to the left?

A.  $\frac{y}{2} = f(x + 2)$

B.  $\frac{y}{2} = f(x - 2)$

C.  $2y = f(x + 2)$

D.  $2y = f(x - 2)$

58. Determine the inverse of the function  $f(x) = \frac{4x + 1}{3x}$ .

A.  $f^{-1}(x) = \frac{1}{3x - 4}$

B.  $f^{-1}(x) = \frac{-1}{3x - 4}$

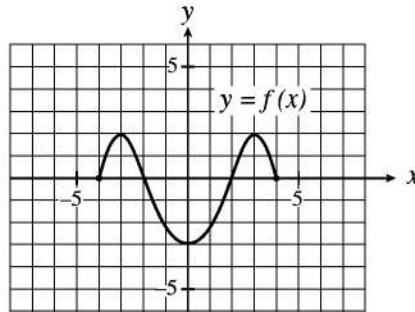
C.  $f^{-1}(x) = \frac{3x}{4x + 1}$

D.  $f^{-1}(x) = \frac{-3x}{4x + 1}$

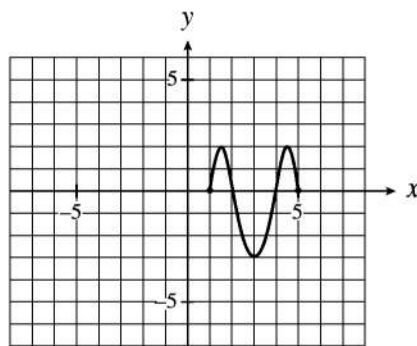
59. The  $y$ -intercept of the function  $y = f(x)$  is 5. Determine the  $y$ -intercept of  $y = -f(x) + 3$

- A. -2                      B. -8                      C. 8                      D. 2

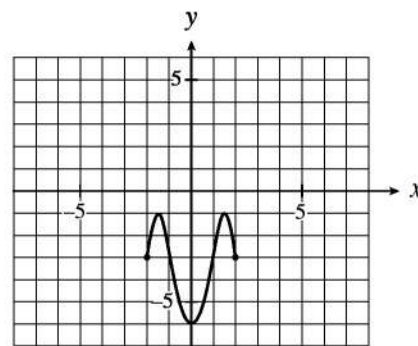
60. The graph of function  $y = f(x)$  is shown. Which of the following is the graph of  $y = f(2x) - 3$ ?



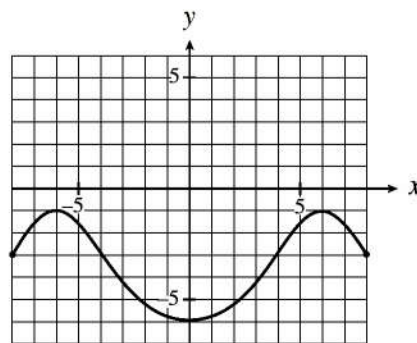
A.



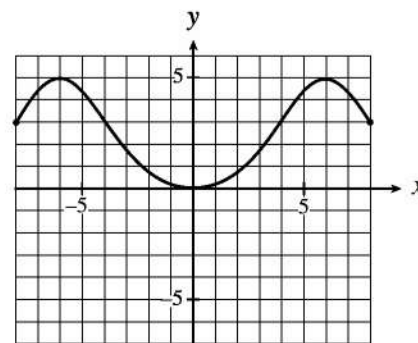
B.



C.



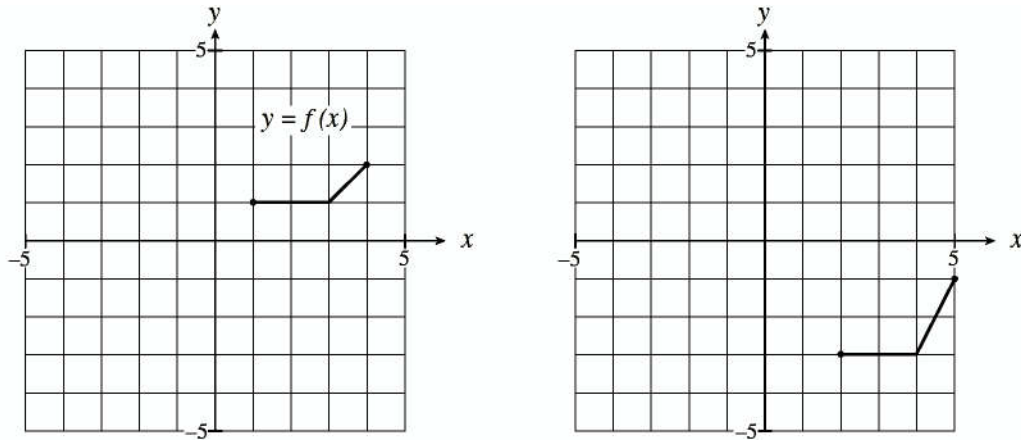
D.



61. The point  $(10, 6)$  is on the graph of  $y = f(x)$ , what point must be on the graph of  $y = f(-2x - 4)$ ?

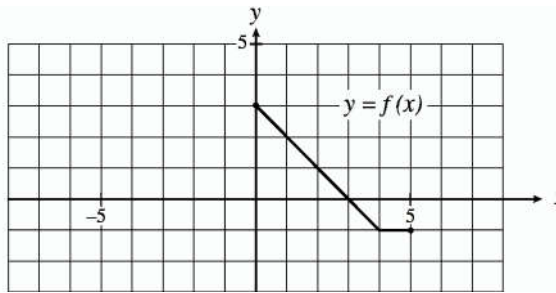
- A.  $(-7, 6)$                       B.  $(-9, 6)$                       C.  $(-22, 6)$                       D.  $(-24, 6)$

62. The graph of  $y = f(x)$  is shown on the left. Determine an equation of the function graphed on the right.



- A.  $y = \frac{1}{2}f(x - 1) - 5$     B.  $y = \frac{1}{2}f(x - 1) - 4$     C.  $y = 2f(x - 1) - 5$     D.  $y = 2f(x - 1) - 4$

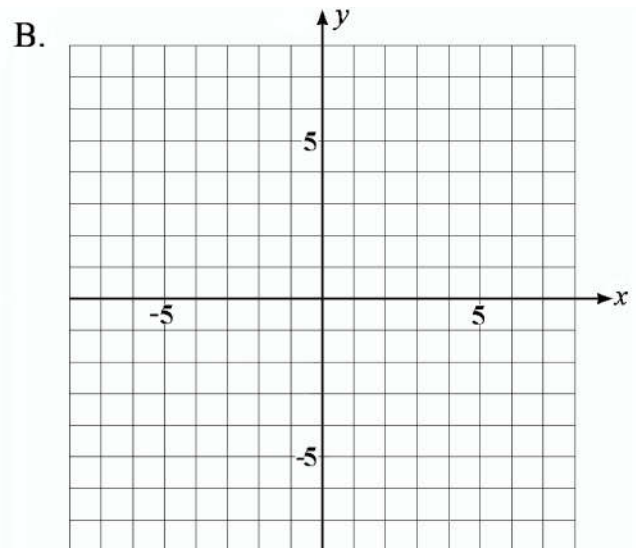
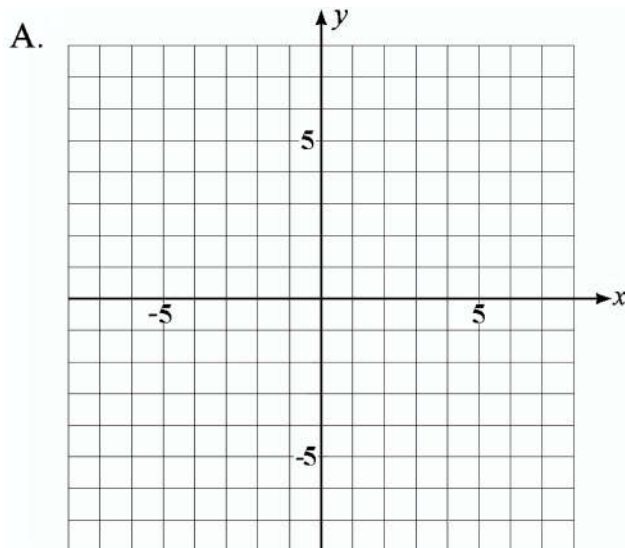
63. The graph of  $y = f(x)$  is shown below.



On the grids provided, sketch the graphs of:

A.  $y = 2|f(x) - 1|$

B.  $y = \frac{1}{f(x)}$





JAN 2008

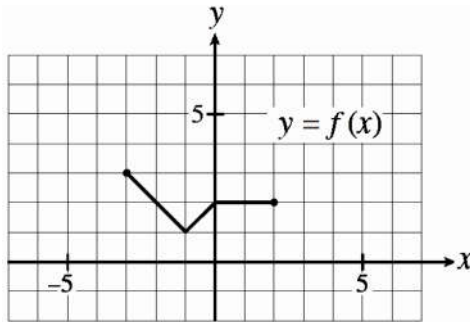
64. If  $y = (x + 4)(x - 2)$ , determine the zeros of the function  $y = f(2x)$ .

- A. -8, 4                      B. -4, 2                      C. -2, 1                      D. -1, 2

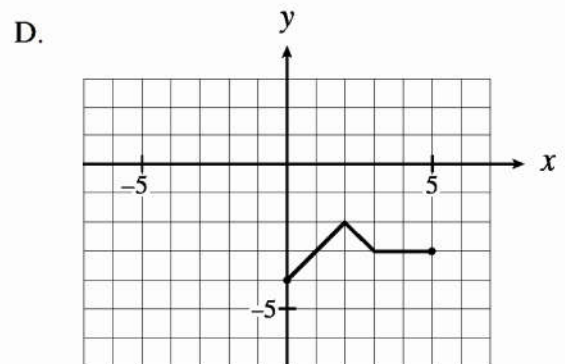
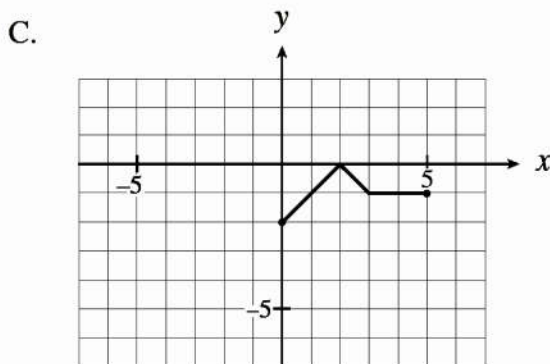
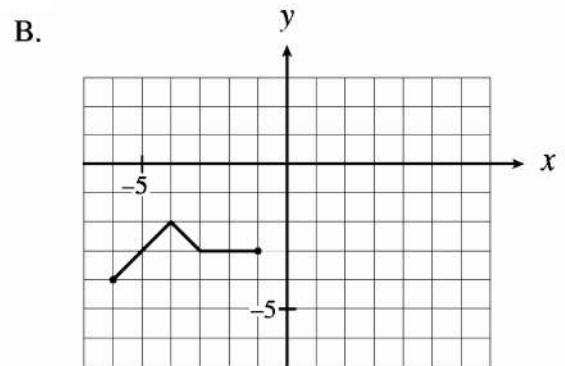
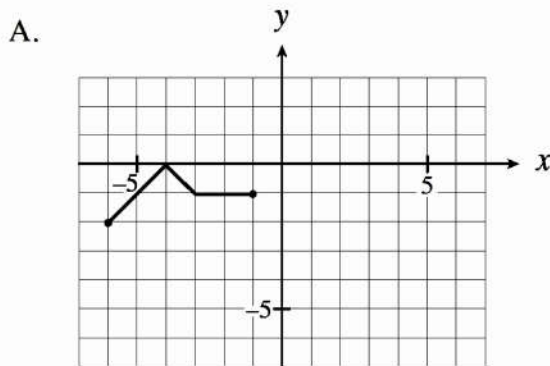
65. Which equation represents the graph of  $y = f(x)$  after it is expanded vertically by a factor of 5?

- A.  $y = \frac{1}{5}f(x)$                       B.  $y = 5f(x)$                       C.  $y = f\left(\frac{x}{5}\right)$                       D.  $y = f(5x)$

66. The graph of  $y = f(x)$  is shown:



Which graph represents the graph of  $y = -f(x + 3) + 1$ ?



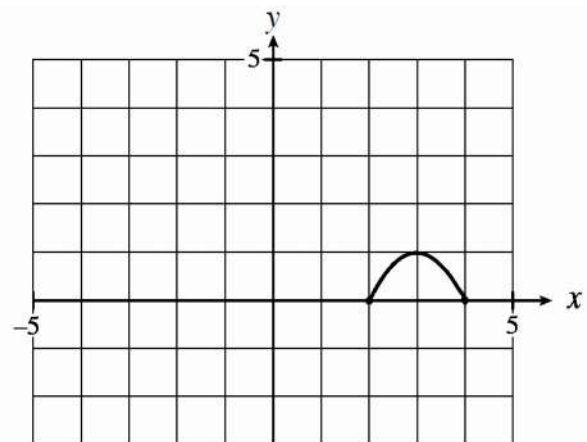
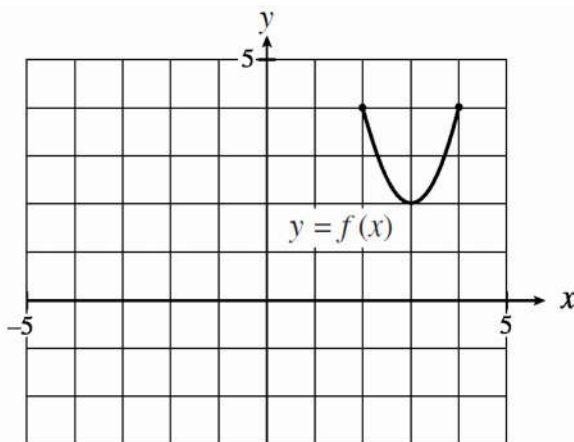
67. Determine the inverse of the function  $f(x) = x^3 - 2$ .

- A.  $f^{-1}(x) = \sqrt[3]{x+2}$     B.  $f^{-1}(x) = \sqrt[3]{x} + 2$     C.  $f^{-1}(x) = \sqrt[3]{x} - 2$     D.  $f^{-1}(x) = \sqrt[3]{x-2}$

68. If the point  $(6, -12)$  is on the graph of  $y = f(x)$ , which point must be on the graph of  $y = f\left(-\frac{1}{3}x + 6\right)$ ?

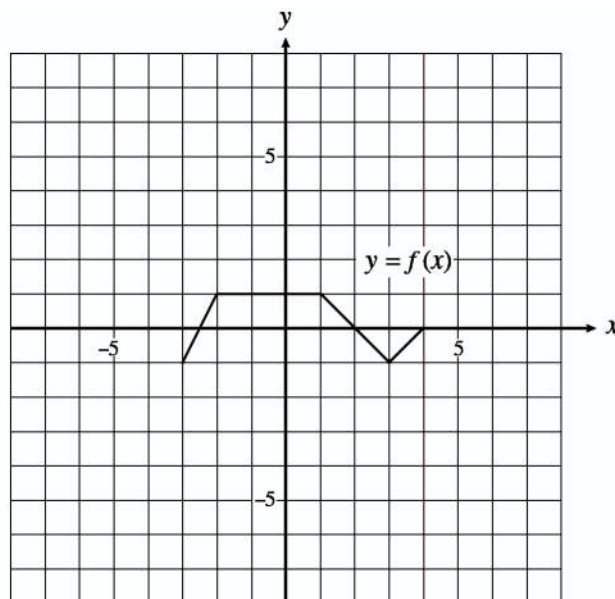
- A.  $(-36, -12)$     B.  $(-24, -12)$     C.  $(0, -12)$     D.  $(16, -12)$

69. The graph of  $y = f(x)$  is shown below on the left. Determine an equation of the function graphed on the right.

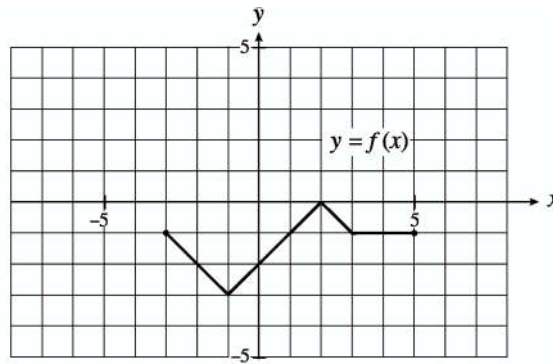


- A.  $y = -\frac{1}{2}f(x)$     B.  $y = -\frac{1}{2}f(x) + 2$     C.  $y = -\frac{1}{2}f(x) + 3$     D.  $y = -\frac{1}{2}f(x) + 4$

70. Given the graph of  $y = f(x)$  below, sketch  $g(x) = 3|f(x)| - 2$ .



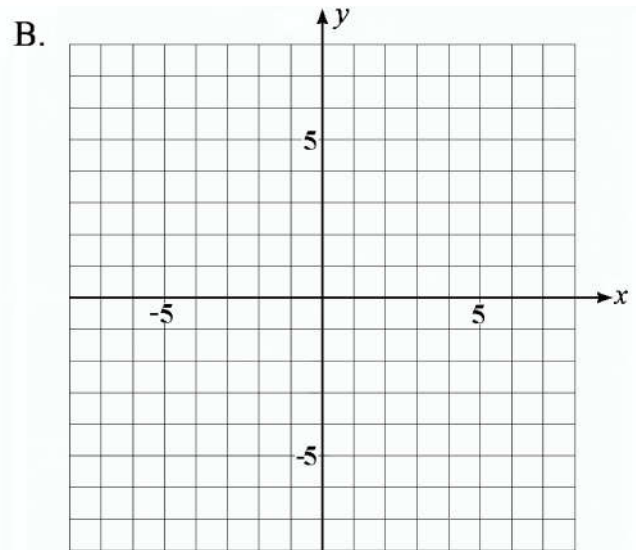
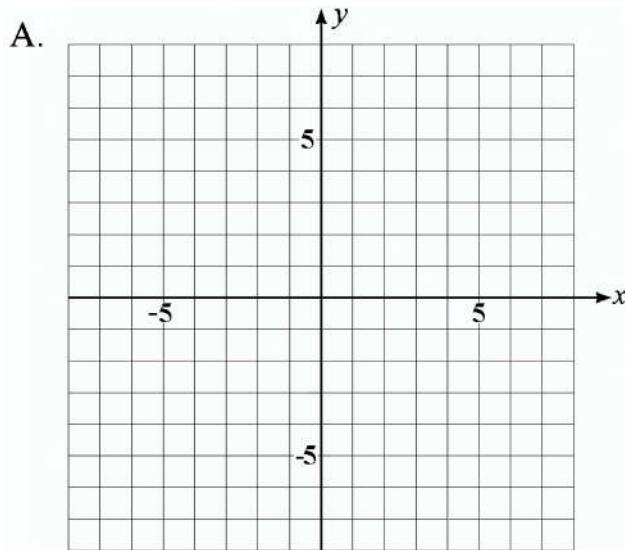
71. The graph of  $y = f(x)$  is shown:



On the grids provided, sketch the graphs of:

A.  $y = -|f(x) + 2|$

B.  $y = \frac{1}{f(x)}$



72. For the function  $f(x) = \frac{1}{x+3}$ : Determine the equation that defines the inverse function,  $f^{-1}(x)$ , and sketch the graphs of  $y = f(x)$  and  $y = f^{-1}(x)$  on the grid provided.

