Circle the correct response. 2 marks each

1. The graph $y = f(x)$ contains the point $(3, 4)$.
   After a transformation, the point $(3, 4)$ is
   transformed to $(5, 5)$. Which of the
   following is a possible equation of the
   transformed function?

   A $y + 1 = f(x + 2)$
   B $y + 1 = f(x - 2)$
   C $y - 1 = f(x + 2)$
   D $y - 1 = f(x - 2)$

2. The graph of $y = |x|$ is transformed by a
   vertical stretch by a factor of 3 about the
   x-axis, and then a horizontal translation of
   3 units left and a vertical translation up
   1 unit. Which of the following points is on
   the transformed function?

   A $(0, 0)$
   B $(1, 3)$
   C $(-3, 1)$
   D $(3, 1)$

3. The graph of $y = \sqrt{x}$ is vertically stretched
   by a factor of 2 about the x-axis, then
   reflected about the y-axis, and then
   horizontally translated left 3. What is the
   equation of the transformed function?

   A $y = 2\sqrt{-x-3}$
   B $y = 2\sqrt{-x+3}$
   C $y = -2\sqrt{x+3}$
   D $y = -2\sqrt{x-3}$

4. Which of the following transformations
   would produce a graph with the same
   x-intercepts as $y = f(x)$?

   A $y = -f(x)$
   B $y = f(-x)$
   C $y = f(x + 1)$
   D $y = f(x) + 1$

5. Given the graph of $y = f(x)$, what is the invariant point under the transformation $y = f(-2x)$?

y = f(x)
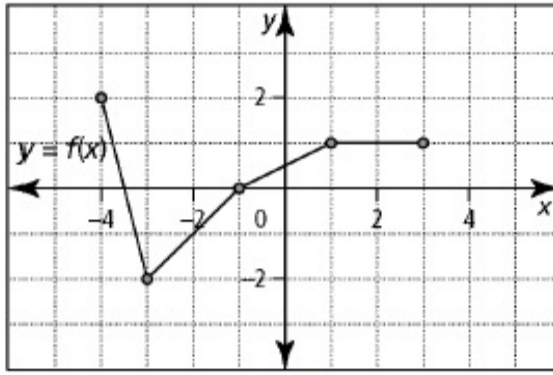
A $(-1, 0)$ B $(0, \frac{1}{2})$

C $(1, 1)$ D $(3, 1)$

6. What will the transformation of the graph of $y = f(x)$ be if y is replaced with $-y$ in the equation $y = f(x)$?

A It will be reflected in the x-axis.
B It will be reflected in the y-axis.
C It will be reflected in the line $y = x$.
D It will be reflected in the line $y = -1$.

7 When the value of a is less than -1, the function $g(x) = ax^2$ has what relationship to the base function $f(x) = x^2$?

A $f(x)$ is compressed vertically
B $f(x)$ is reflected and compressed vertically
C $f(x)$ is stretched vertically
D $f(x)$ is reflected and stretched vertically

8 Which choice best describes the combination of transformations that must be applied to the graph of $f(x) = |x|$ to obtain the graph of $g(x) = f(2x - 4)$?

A   a horizontal stretch by a factor of 2 and a horizontal translation of 2 units to the left

B   a horizontal stretch by a factor of $\frac{1}{2}$ and a horizontal translation of 4 units to the right

C   a horizontal stretch by a factor of $\frac{1}{2}$ and a horizontal translation of 2 units to the right

D   a horizontal stretch by a factor of -2 and a horizontal translation of 2 units to the right

9 Which of the following functions is the correct inverse for the function $f(x) = -\frac{9}{2}x + 6$?

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

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

10   Which graph represents the inverse of the function shown?

A

C

D

B
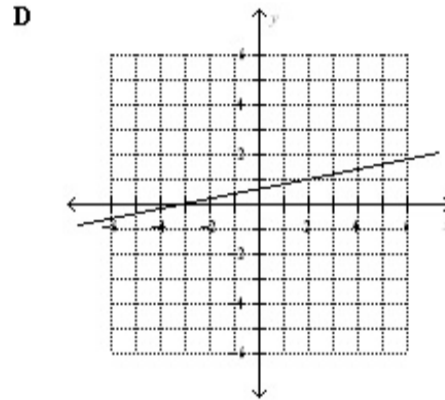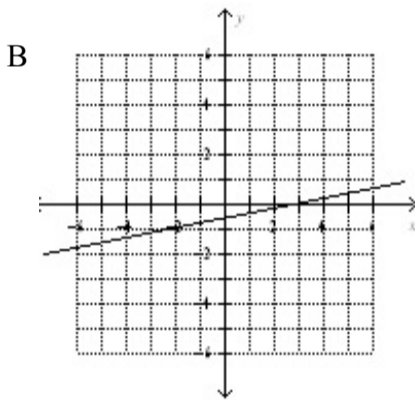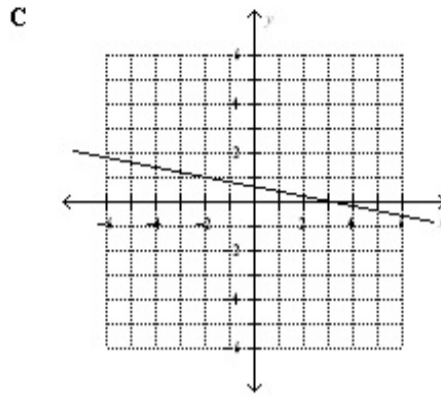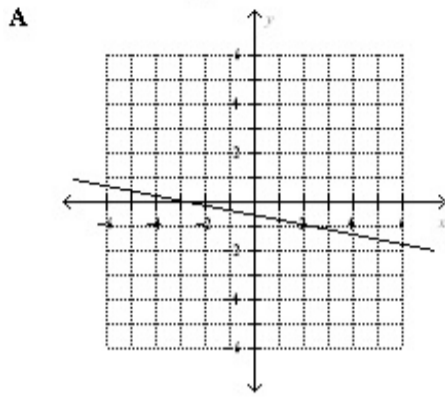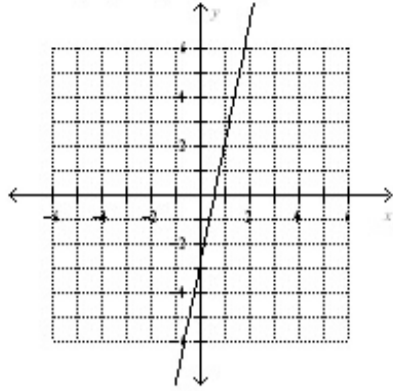
11   If y = f(x) is transformed by the transformation, $y - 6 = -4f(-2x + 8)$, which statement below is true?

A) f(x) is transformed 8 units left, 6 units down with a horizontal stretch of -2 and a vertical stretch of -4

B) f(x) is transformed 8 units left, 6 units up with a horizontal stretch of $\frac{1}{2}$ and a vertical stretch of $\frac{1}{4}$

C) f(x) is transformed 4 units left, 6 units up with a horizontal stretch of $\frac{1}{2}$ and a vertical stretch of 4

D) f(x) is transformed 4 units right, 6 units up with a horizontal stretch of .5 and a vertical stretch of 4, reflected in the x axis.

12   What would be the mapping rule for the transformation performed in question 11?

A) $(x,y) \rightarrow (-.5x - 8, 6y - 4)$
B) $(x,y) \rightarrow (-.5x - 8, -4y + 6)$
C) $(x,y) \rightarrow (-.5x + 4, -4y - 6)$
D) $(x,y) \rightarrow (-.5x + 4, -4y + 6)$

Part II

1)   Given the graph of y = f(x) below, sketch the graph of the transformation
$y = -2f(-2(x - 4)) + 1$ by using a table of values for the key points of y = f(x) and a
mapping rule.   10 marks
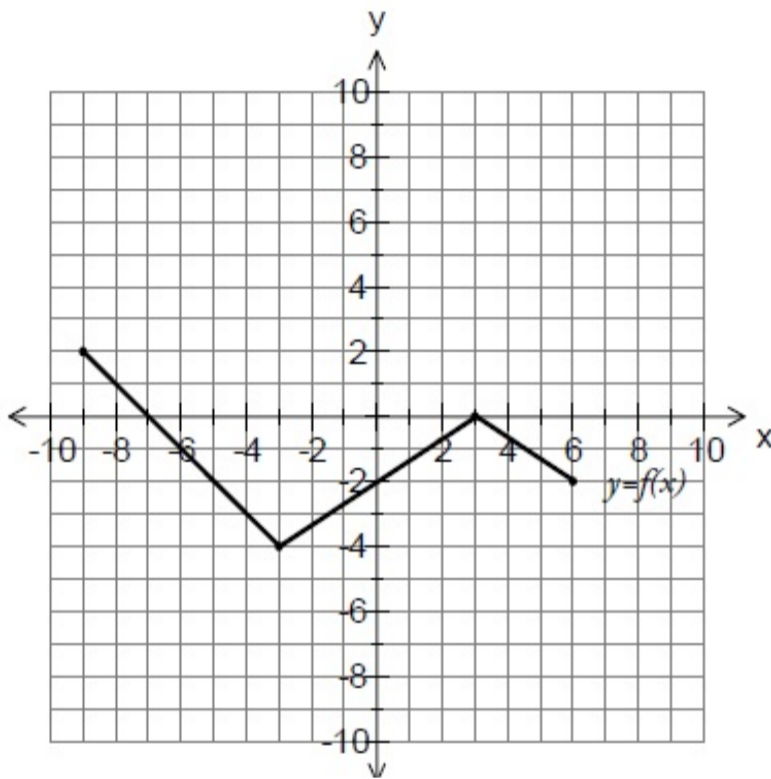
2) Given the sketch of y = f(x) below, y = g(x) is a transformation of y = f(x). Determine the equation of the transformation in the form y = af(b(x-h))+k algebraically. Be sure to show all workings.   10 marks
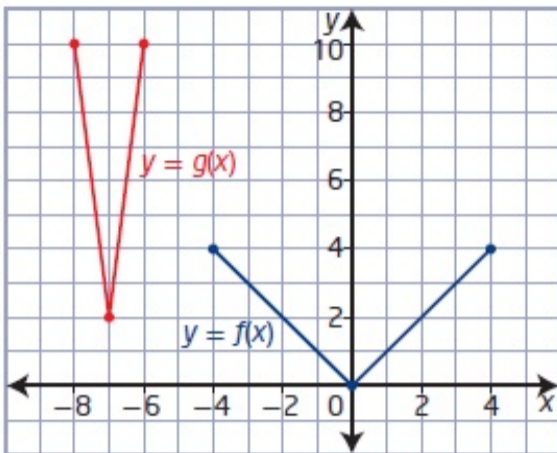
3   Given $y = x^2 - 4x + 1$,

A)   determine the equation of the inverse. 6 marks

B)   Restrict the domain of y=f(x) above and write the equation of the inverse now.

3 marks

C)   Use a table of values along with your restricted domain in B to sketch the graphs
of $y = f(x)$ and $y = f^{-1}(x)$ on the same x-y plane with the mirror y = x.

8 marks