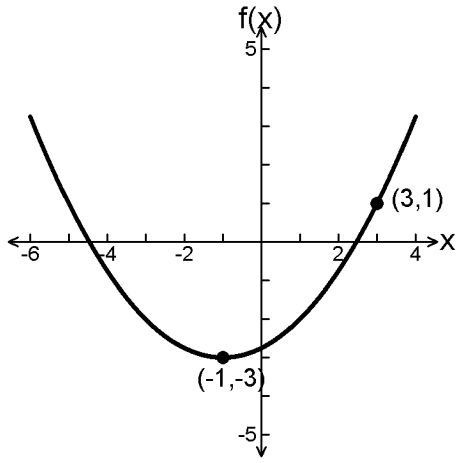
AP Calculus

Graphs and Transformations

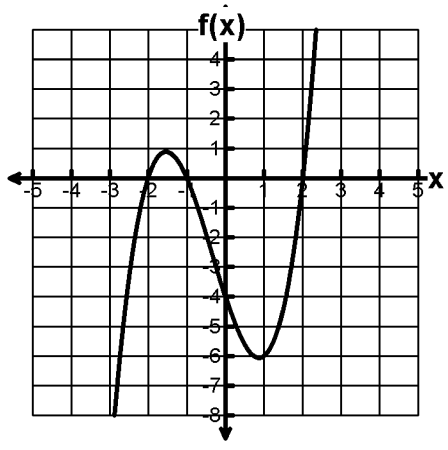
Name _____ Date _____



1. The figure above shows the graph of quadratic function f with vertex at $(-1, -3)$. If the parabola shown is reflected in the x-axis, what would be the image of the vertex after the reflection?

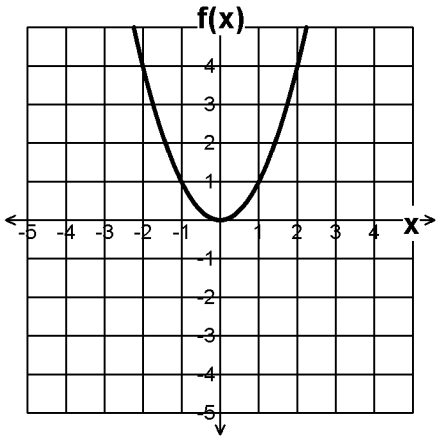
a) $(1, 3)$ b) $(-1, 3)$ c) $(1, -3)$

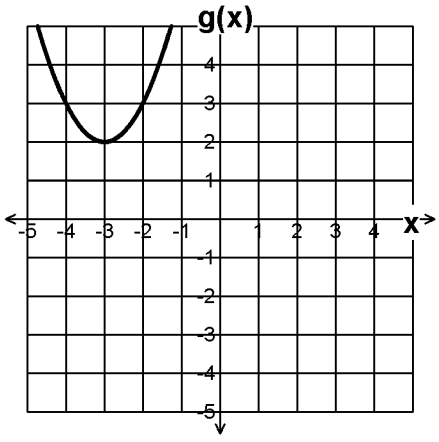
d) $(3, 1)$ e) $(3, -1)$



2. The figure above shows the graph of cubic function $f(x) = x^3 + ax^2 + bx + c$. What is the y-intercept of $f(x) - 2 = x^3 + ax^2 + bx + c$?

a) -6 b) -2 c) 0 d) 1 e) 2





3. The figures above show the graphs of quadratic functions f and g. Which equation demonstrates the relationship between the two functions?

a) $g(x) = f(x + 3) - 2$ b) $g(x) = f(x - 3) - 2$

c) $g(x) = f(x + 3) + 2$ d) $g(x) = 3f(x) - 2$

e) none of these

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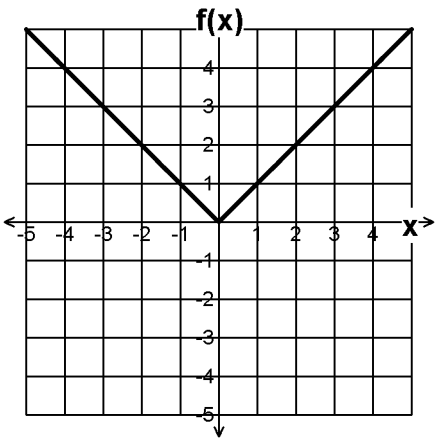
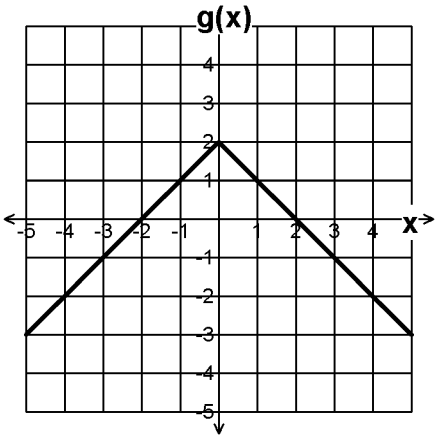


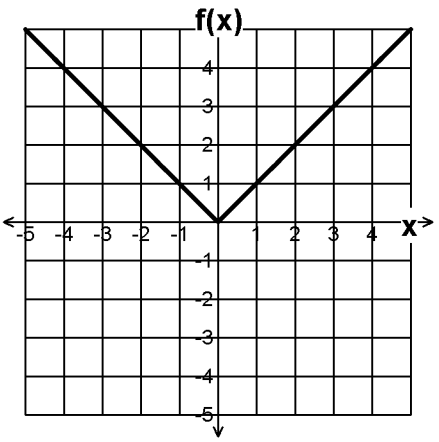


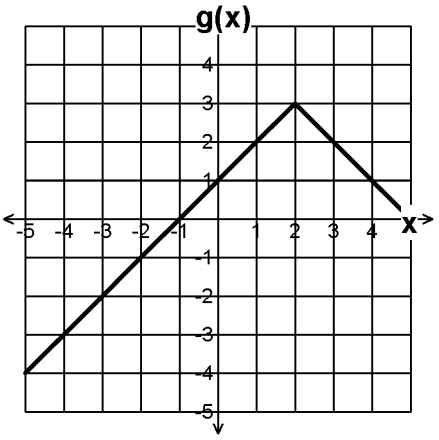
4. The figures above show the graphs of functions f and g. Which equation demonstrates the relationship between the two functions?

a) $g(x) = -f(x) + 2$ b) $g(x) = f(x + 2)$

c) $g(x) = -f(x + 2)$ d) $g(x) = -f(x) - 2$

e) $g(x) = -f(x + 2) - 2$





5. The figures above show the graphs of functions f and g. Which equation demonstrates the relationship between the two functions?

a) $g(x) = -f(x) + 3$ b) $g(x) = -f(x - 2) + 3$

c) $g(x) = f(x + 2)$ d) $g(x) = -f(x) - 2$

e) $g(x) = f(x + 2) - 3$

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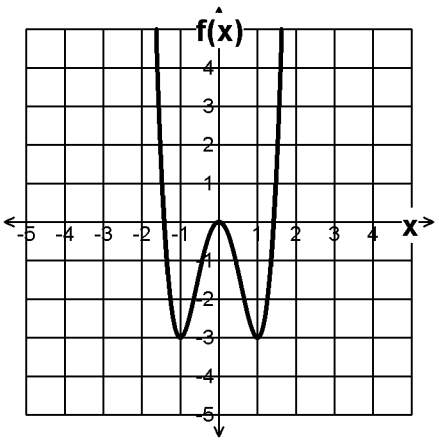
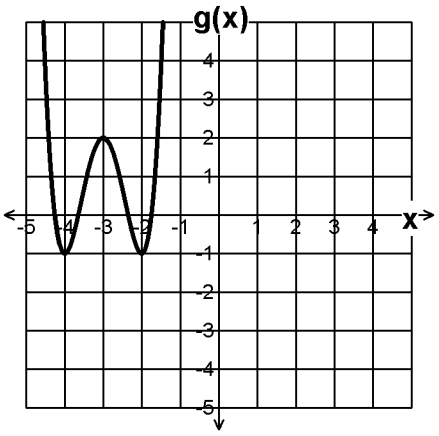


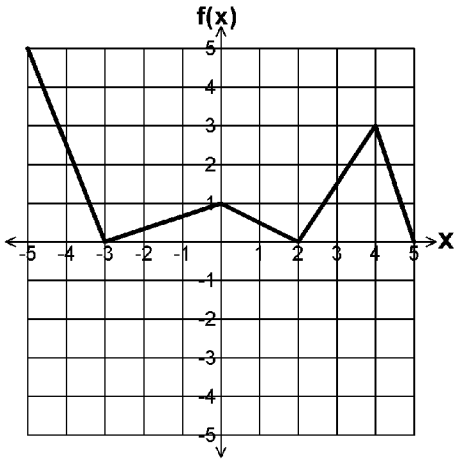


6. The figures above show the graphs of functions f and g. The function f is defined by $f(x) = 3x^4 - 6x^2$. If $g(x) = f(x - h) + v$, where h and v are constants, what is the value of hv?

a) -12 b) -6

c) 6 d) 12

e) none of these



7. The graph of function f is shown above. Which of the following statements are true about f?

I. f is increasing for $-3 \leq x \leq 0$.

II. f has a zero at $x = 5$.

III. f is decreasing for $0 \leq x \leq 2$.

a) I only b) II only

c) III only d) I and II only

e) I, II and III

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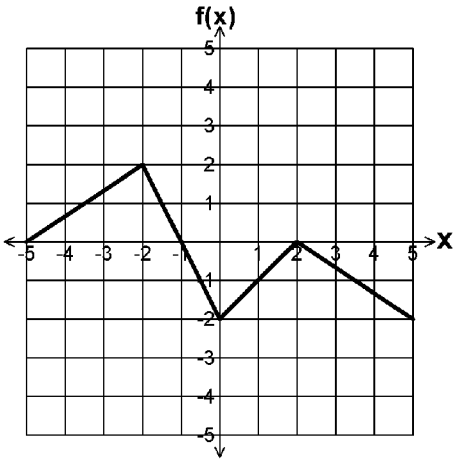


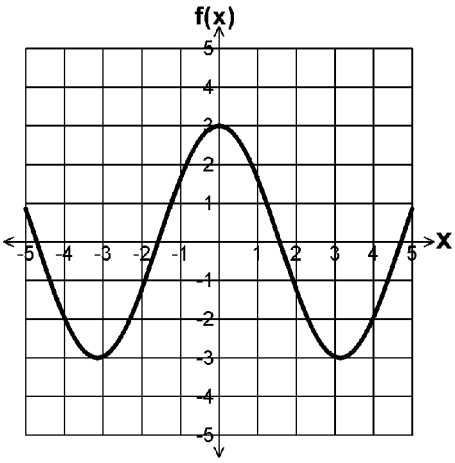
8. The figure above shows the graph of function f. Determine which of the following statements are true about f.

   I. f is constant for $2 \leq x \leq 5$.

   II. The y-intercept times a zero of f could be 10.

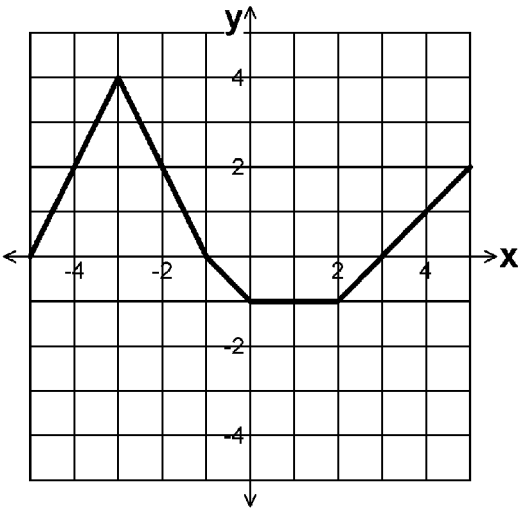
   III. The difference of two of f's zeros could be 4.

   a) I only
   b) II only
   c) III only
   d) II and III only
   e) I, II and III



9. The figure above shows the graph of function f. What is the maximum value of f?

   a) -3 b) -1 c) 1 d) 2 e) 3



10. The figure above shows the graph of function f. If the function g is defined by $g(x) = f(x+3) - 2$, what is the value of $g(1)$?

    a) -4 b) -1 c) 1 d) 2 e) 4

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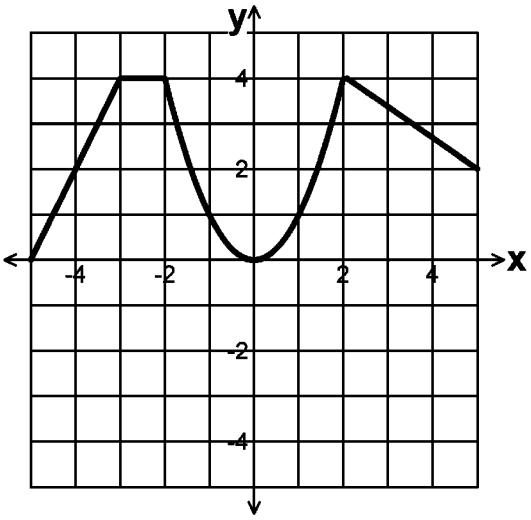
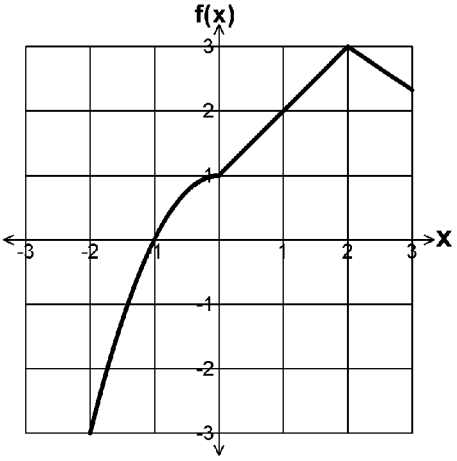
11. The figure above shows the graph of function f. If the function g is defined by $g(x) = f(1-2x)+1$, what is the value of $g(2)$?

a) -4 b) -3 c) 1 d) 3 e) 5



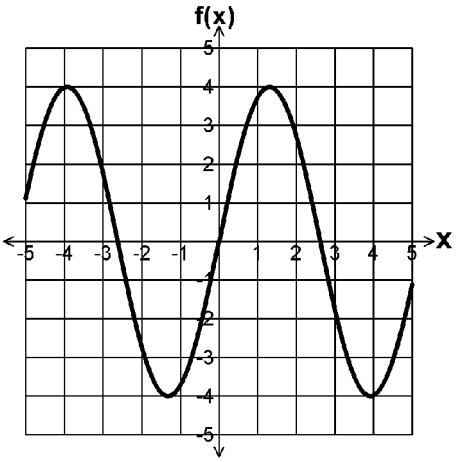
12. The figure above shows the graph of function f. If the function g is defined by $g(x) = f(1-x^2)-7$, what is the value of $g(2)$?

a) -9 b) -3 c) 3 d) 6 e) 9



13. The figure above shows the graph of function f. Which of the following is closest to $f(-\frac{3}{2})$?

a) -2 b) -1 c) 0 d) 1 e) 2



14. The figure above shows the graph of function f. For how many values of x does $f(x) = 2$?

a) 1 b) 2 c) 3 d) 4 e) 5

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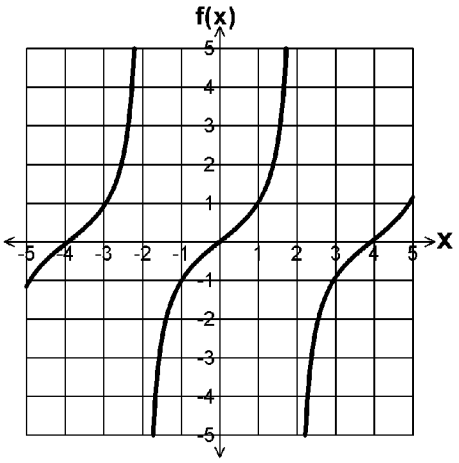
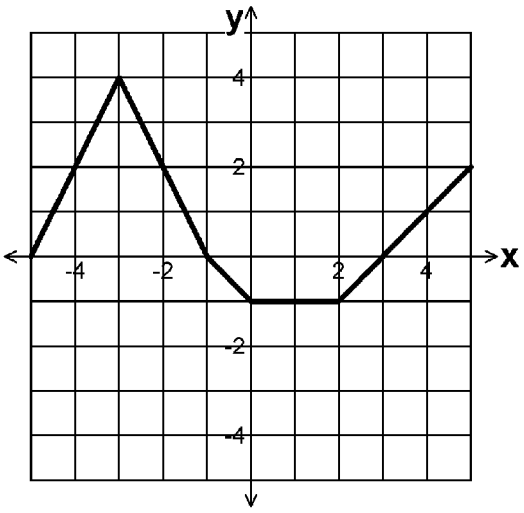


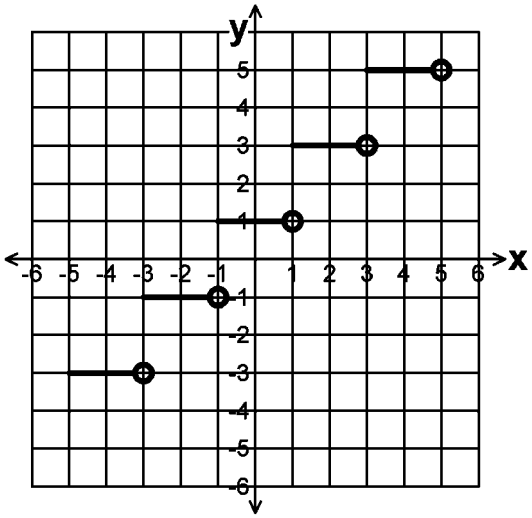
15. The figure above shows the graph of function f. For how many values of x does $f(x) = 0$?

a) 1 b) 2 c) 3 d) 4 e) 5



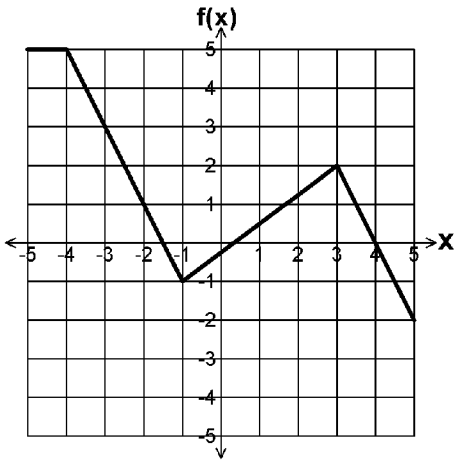
16. The figure above shows the graph of function f. If $f(a) = -1$, which of the following is a possible value of a?

a) -5 b) -3 c) -1 d) 1 e) 4



17. The figure above shows the graph of function f. If $f(a) = -1$, which of the following is a possible value of a?

a) -5 b) -2 c) -1 d) 1 e) 4



18. The graph of $y = f(x)$ is shown above. If $f(-3) = k$, which of the following is the value of $f(k)$?

a) -2 b) -1 c) 0 d) 1 e) 2

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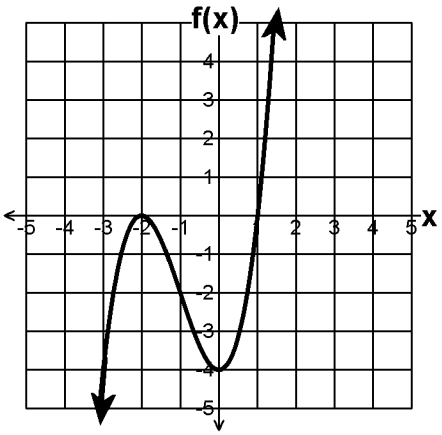


19. The figure above shows the graph of cubic function f. Which function represents f?

a) $f(x) = x^3 + 3x^2 - 2x + 4$

b) $f(x) = x^3 - 2x^2 - 2x + 1$

c) $f(x) = x^3 + 3x^2 - 4$

d) $f(x) = x^3 - 4x - 4$

e) $f(x) = x^3 + 2x^2 - 4x + 4$

20. If $f(x) = \dfrac{4t^3}{S}$, what happens to the value of $f(x)$ when t is doubled and S is doubled?

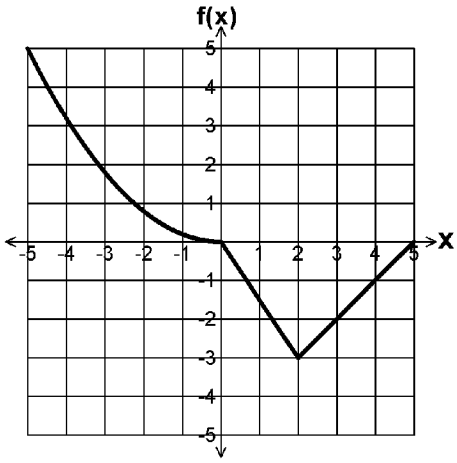
a) $f(x)$ is multiplied by $\frac{2}{3}$

b) $f(x)$ is multiplied by 2

c) $f(x)$ is multiplied by $\frac{8}{3}$

d) $f(x)$ is multiplied by 4

e) $f(x)$ is not changed



21. Based on the graph of the function f above, what are the values of x for which $f(x)$ is decreasing?

a) $-5 < x < -4$

b) $-4 < x < 0$

c) $-2 < x < 2$

d) $0 < x < 5$

e) $-5 < x < 2$

22. If $f(x) = (x+5)(x+2)$, which expression represents *all* values of x for which $f(x) < 0$?

a) $x < -2$

b) $x > 5$

c) $x < -2$ or $x > 5$

d) $-5 < x < -2$

e) $-2 < x < 5$

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23. If $f(x) = (x+1)(x+2)(x+3)$, then when is $f(x) < 0$?

I. $x < -3$

II. $x > 2$

III. $-2 < x < -1$

a) I only
b) II only
c) III only
d) I and II only
e) I and III only

24. If $f(x) = |x+1| - 1$, then point (x, y) cannot be

a) in quadrant I
b) in quadrant II
c) in quadrant III
d) in quadrant IV
e) on the x- or y-axis

AP Calculus Graphs and Transformations Hopkins 9/8/2014

1.
Answer: b
CodePath: EAS.SAT.G.H.1

2.
Answer: b
CodePath: EAS.SAT.G.H.4

3.
Answer: c
CodePath: EAS.SAT.G.H.6

4.
Answer: a
CodePath: EAS.SAT.G.H.10

5.
Answer: b
CodePath: EAS.SAT.G.H.11

6.
Answer: b
CodePath: EAS.SAT.G.H.24

7.
Answer: e
CodePath: EAS.SAT.G.G.7

8.
Answer: d
CodePath: EAS.SAT.G.G.9

9.
Answer: e
CodePath: EAS.SAT.G.G.12

10.
Answer: b
CodePath: EAS.SAT.G.G.15

11.
Answer: e
CodePath: EAS.SAT.G.G.16

12.
Answer: b
CodePath: EAS.SAT.G.G.18

13.
Answer: b
CodePath: EAS.SAT.G.G.20

14.
Answer: d
CodePath: EAS.SAT.G.G.21

15.
Answer: c
CodePath: EAS.SAT.G.G.22

16.
Answer: d
CodePath: EAS.SAT.G.G.28

17.
Answer: b
CodePath: EAS.SAT.G.G.29

18.
Answer: e
CodePath: EAS.SAT.G.G.35

19.
Answer: c
CodePath: EAS.SAT.G.G.40

20.
Answer: d
CodePath: EAS.SAT.G.G.42

21.
Answer: e
CodePath: EAS.SAT.G.G.53

22.
Answer: d
CodePath: EAS.SAT.G.G.56

23.
Answer: e
CodePath: EAS.SAT.G.G.57

24.
Answer: d
CodePath: EAS.SAT.G.G.60