

Name: **Key**

Hour:

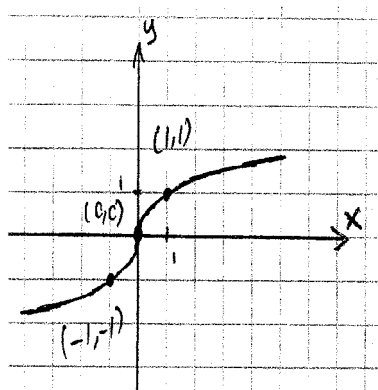
Exam 3

**Directions:** (1) Answer each problem completely, show your algebra (you need not show your arithmetic), and box your final answer. (2) No notes, no textbooks, no communication devices, no discussion. (3) You may use an ACT-approved calculator.

100 points. 50 minutes.

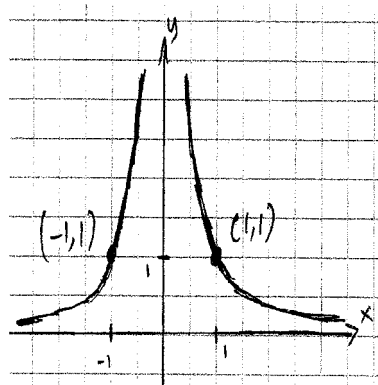
Math 107-12/18, Fall 2014 (Dr. Daniel Brice)

1. [8 points] Match the graph of
- $f(x)$
- to its formula.



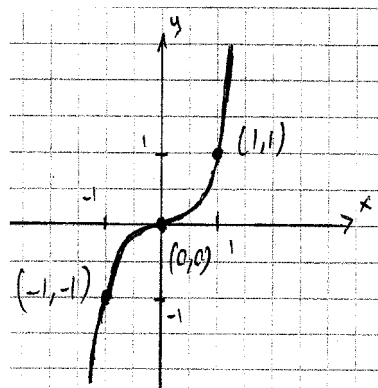
- (a)  $f(x) = \sqrt[3]{x}$   
 (b)  $f(x) = \sqrt{x}$   
 (c)  $f(x) = x^3$   
 (d)  $f(x) = x^2$   
 (e) None of these.

2. [8 points] Match the graph of
- $f(x)$
- to its formula.



- (a)  $f(x) = x^2$   
 (b)  $f(x) = |x|$   
 (c)  $f(x) = \frac{1}{x}$   
 (d)  $f(x) = \frac{1}{x^2}$   
 (e) None of these.

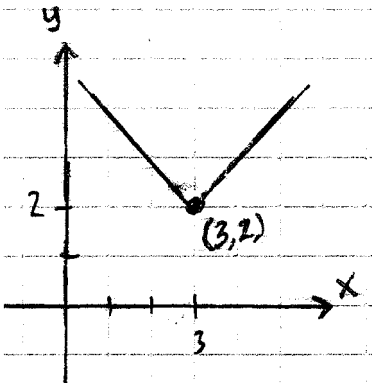
3. [8 points] Match the graph of
- $f(x)$
- to its formula.



- (a)  $f(x) = x^2$   
 (b)  $f(x) = x^3$   
 (c)  $f(x) = \sqrt{x}$   
 (d)  $f(x) = \sqrt[3]{x}$   
 (e) None of these.

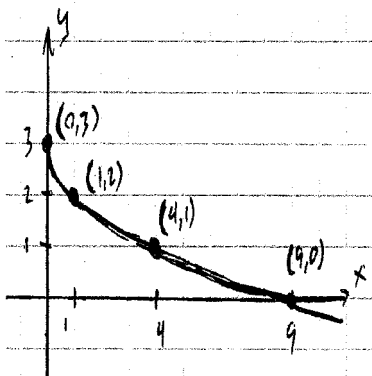
ADB - CBC - AA - DA

4. [8 points] Match the graph of  $f(x)$  to its formula.



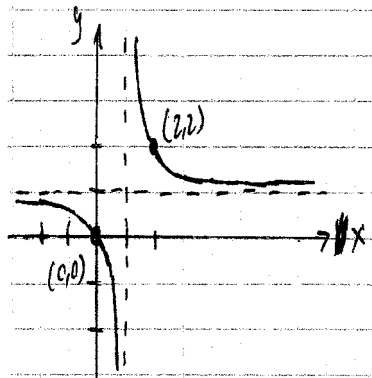
- (a)  $f(x) = |x - 3| - 2$
- (b)  $f(x) = |x + 3| - 2$
- ☒ (c)  $f(x) = |x - 3| + 2$
- (d)  $f(x) = |x + 3| + 2$
- (e) None of these.

5. [8 points] Match the graph of  $f(x)$  to its formula.



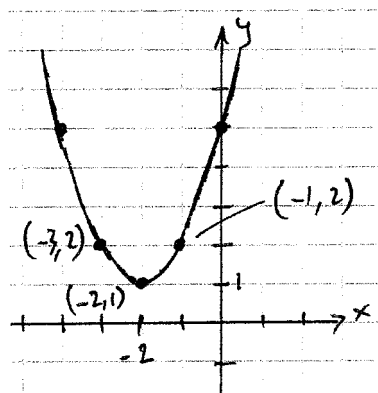
- (a)  $f(x) = -\sqrt{x + 3}$
- ☒ (b)  $f(x) = -\sqrt{x} + 3$
- (c)  $f(x) = \sqrt{x + 3}$
- (d)  $f(x) = \sqrt{x} + 3$
- (e) None of these.

6. [8 points] Match the graph of  $f(x)$  to its formula.



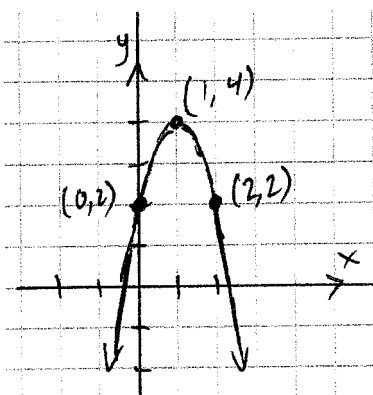
- (a)  $f(x) = \frac{1}{x - 1} - 1$
- (b)  $f(x) = \frac{1}{x + 1} - 1$
- ☒ (c)  $f(x) = \frac{1}{x - 1} + 1$
- (d)  $f(x) = \frac{1}{x + 1} + 1$
- (e) None of these.

7. [8 points] Match the graph of  $f(x)$  to its formula.



- (a)  $f(x) = (x+2)^2 + 1$
- (b)  $f(x) = (x-2)^2 + 1$
- (c)  $f(x) = (x+2)^2 - 1$
- (d)  $f(x) = (x-2)^2 - 1$
- (e) None of these.

8. [8 points] Match the graph of  $f(x)$  to its formula.



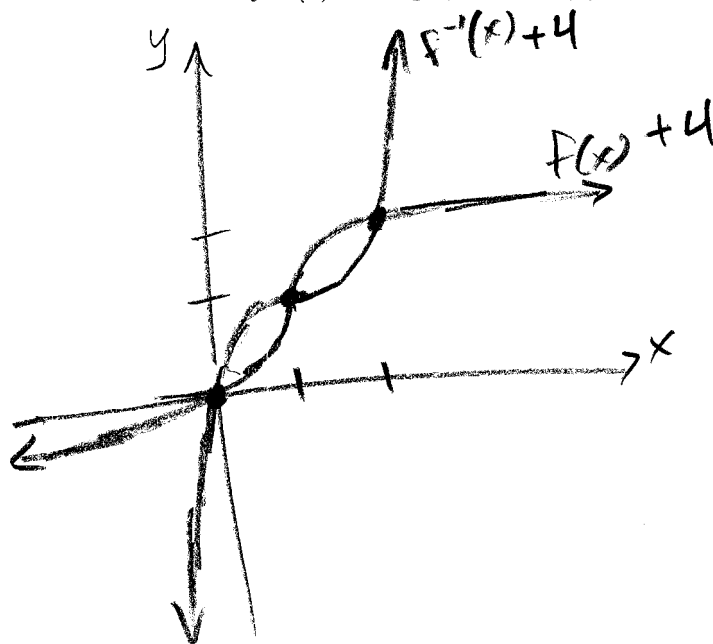
- (a)  $f(x) = -2x^2 + 4x + 2$
- (b)  $f(x) = -\frac{1}{2}x^2 + 8x + 2$
- (c)  $f(x) = 2x^2 + 4x + 2$
- (d)  $f(x) = \frac{1}{2}x^2 + 8x + 2$
- (e) None of these.

9. [12 points]  $f(x) = \sqrt[3]{x-1} + 1$ . Find the formula for  $f^{-1}(x)$ , then graph both  $f(x)$  and  $f^{-1}(x)$  on the same coordinate plane.

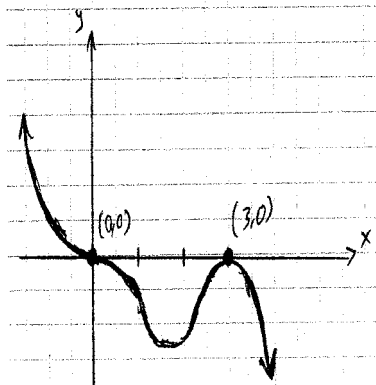
$f$ : -1  
cube root  
+1

$f^{-1}$ : -1  
cube  
+1

$$f^{-1}(x) = (x-1)^3 + 1$$

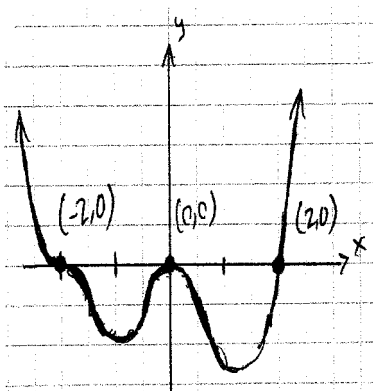


10. [8 points] Match the graph of  $f(x)$  to its formula.



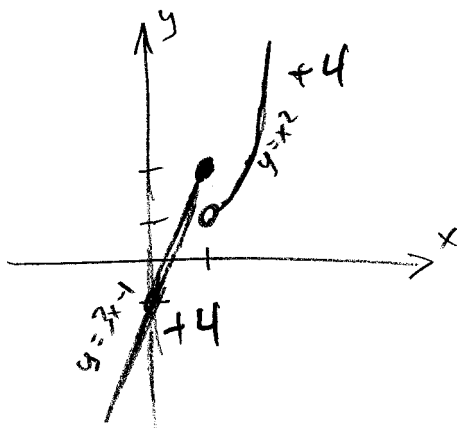
- (a)  $f(x) = x^3(x+3)^2$
- (b)  $f(x) = x^3(x-3)^2$
- (c)  $f(x) = -x^3(x+3)^2$
- (d)  $f(x) = -x^3(x-3)^2$
- (e) None of these.

11. [8 points] Match the graph of  $f(x)$  to its formula.



- (a)  $f(x) = x^2(x+2)^3(x-2)$
- (b)  $f(x) = x^2(x+2)(x-2)^3$
- (c)  $f(x) = -x^2(x+2)^3(x-2)$
- (d)  $f(x) = -x^2(x+2)(x-2)^3$
- (e) None of these.

12. [12 points]  $f(x) = \begin{cases} 3x-1 & \text{if } x \leq 1 \\ x^2 & \text{if } x > 1 \end{cases}$ . Graph  $f(x)$ . Does  $f(x)$  have any discontinuities?



Discontinuous  
at  $x=1$ .  
+4