MAC 1105 Test 3: Quadratics, Radicals, and Inverses

Name:

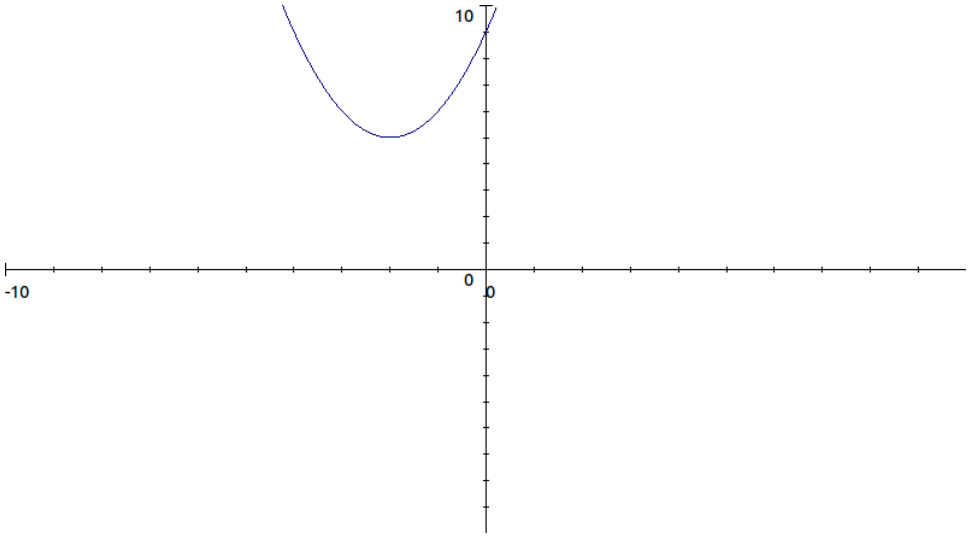
November 4, 2013

Show work for partial credit.

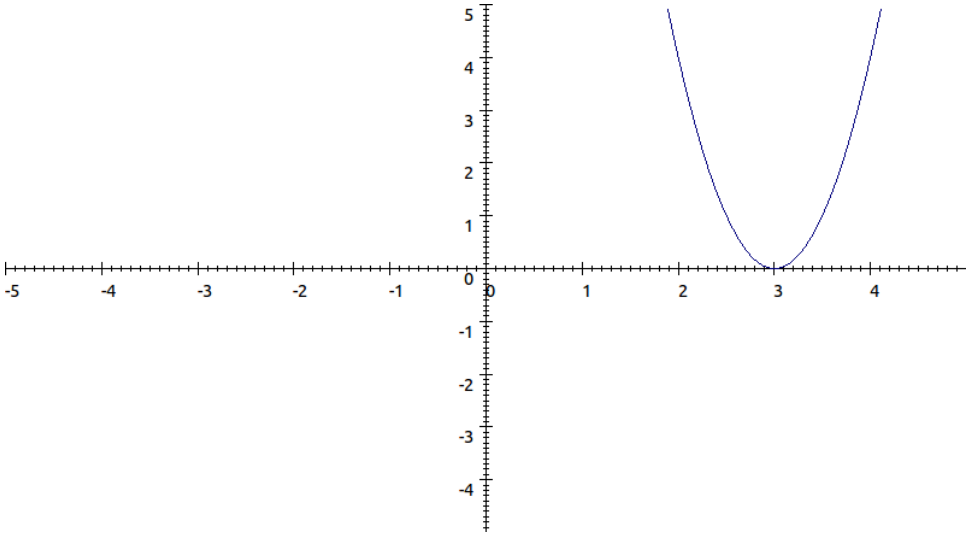
1. Pair these functions with their graphs.

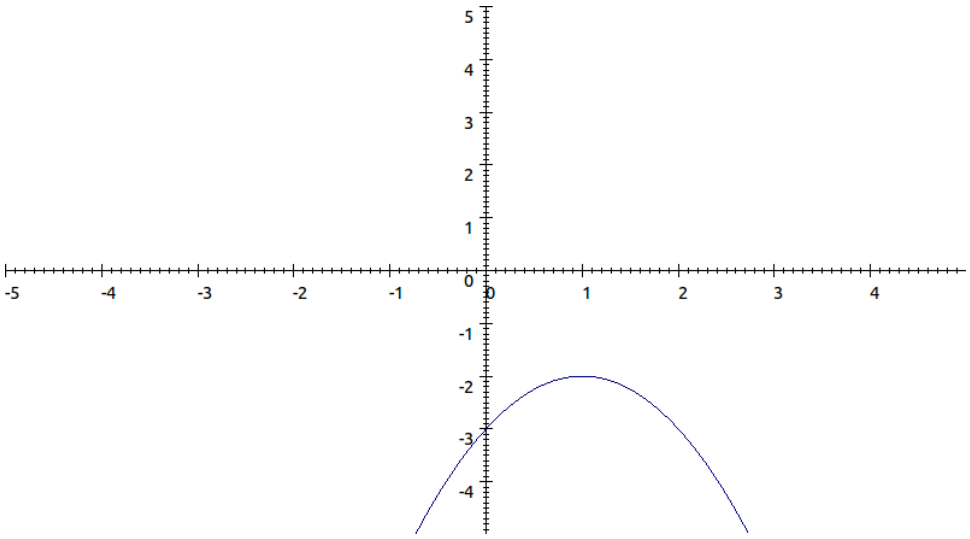
$$\begin{aligned} f(x) &= -(x-1)^2 - 2 \\ g(x) &= 4(x-3)^2 \\ h(x) &= (x+2)^2 - 5 \end{aligned}$$

(a)



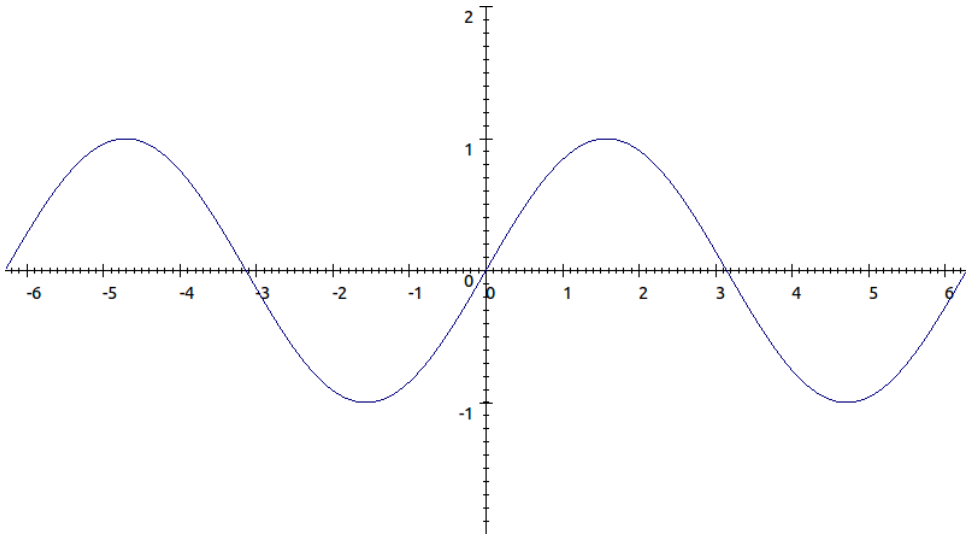
(b)



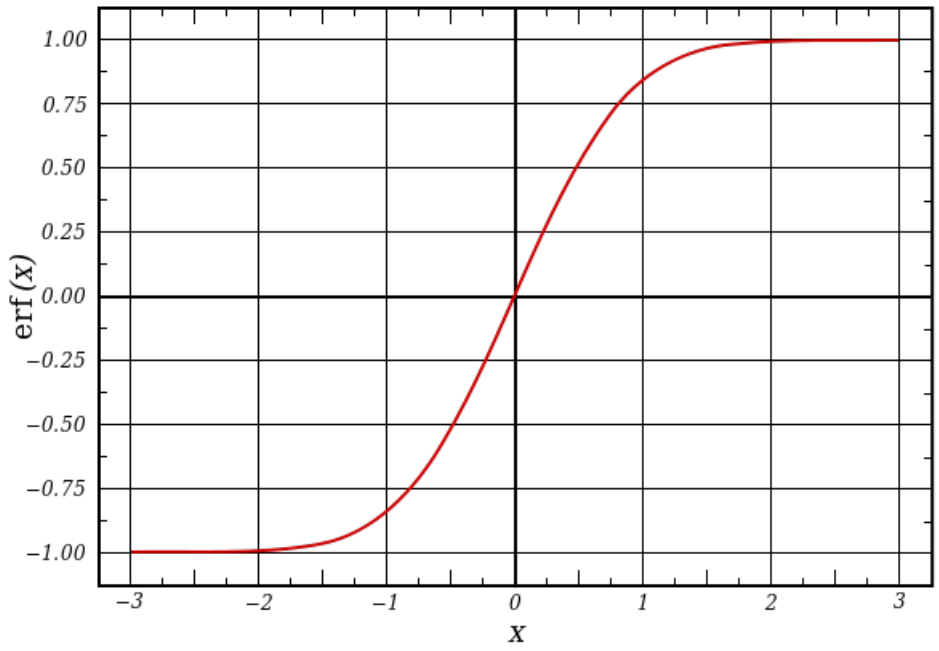


(c)

2. Tell if each function is one to one.



(a)



(b)

(c) $f(x) = 3x + 2$

3. Given $f(x) = x - 3$, which of these is true?

   (a) $f^{-1}(x) = \frac{1}{x} - \frac{1}{3}$

   (b) $f^{-1}(x) = \frac{1}{x-3}$

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

   (d) $f^{-1}(x) = \frac{x}{3}$

4. The C-9 jet does parabolic manouvers to simulate reduced gravity. We can use the function $A(t) = -4.9t^2 + 87.2t + 9144$, where t is time in seconds and A is altitude in meters. At what time is the jet at its highest point?

   (a) 3.45 s

   (b) 5.82 s

   (c) 8.90 s

   (d) 11.46 s

5. What kind of solutions does $2k^2 - 5k + 7 = -9$ have?

   (a) one real solution

   (b) two imaginary solutions

   (c) two real solutions

6. The function

$$S(L) = 2\pi\sqrt{\frac{L}{32}}$$

   represents the swing of a pendulum, where L is the length of the pendulum in feet and S is the time in seconds for the pendulum to do a full swing (back and forth). How long must a pendulum be to make one full swing in 2.5 seconds?

(a) 5.1 feet

(b) 7.7 feet

(c) 12.7 feet

(d) 25 feet

7. When Kieran solves $\sqrt{x+4} = -x+2$, they get $x = 0$ and $x = 5$. What should they do now?

   (a) Keep both solutions

   (b) Eliminate $x = 0$

   (c) Eliminate $x = 5$

8. Are $f(x) = \sqrt[3]{x-2}$ and $g(x) = (x+2)^3$inverses?

   (a) Yes

   (b) No

9. $h(x) = x^2 - 2$; $r(x) = -x - 4$. Find $h(r(3))$.

   (a) -8

   (b) -11

   (c) 25

   (d) 47

10. The profit a coat manufacturer makes each day is modeled by $P(x) = -x^2 + 120x - 2000$, where P is the profit and x is the price of each coat sold. For what values of x does the company make a profit?

    (a) $x \in [0, 20] \cup [100, \infty)$

    (b) $x \in [20, 100]$

    (c) $x \in (20, 100)$

    (d) $x \in [0, 20) \cup (100, \infty)$