

Precalculus (23554) (Math 1) HW Set #5. Due in class on Wednesday, March 25th.

In order to receive a ✓, you must attempt all problems and write out all steps leading to your answers neatly and legibly. You cannot simply write the correct answer to demonstrate your mathematical understanding.

You must include your name, the course title and section number on the first page. All homework sets must be stapled. No late homework will be accepted without my express permission. You may receive a ✗ if these guidelines are not followed.

Good luck!

For the given functions f and g , find the requested composite function.

1) $f(x) = 8x + 13$, $g(x) = 3x - 1$; Find $(f \circ g)(x)$. 1) _____

2) $f(x) = \frac{5}{x-2}$, $g(x) = \frac{1}{8x}$; Find $(f \circ g)(x)$. 2) _____

3) $f(x) = x^2 - 6$, $g(x) = x^2 + 4$; Find $(f \circ g)(x)$. 3) _____

Decide whether the composite functions, $f \circ g$ and $g \circ f$, are equal to x .

4) $f(x) = x^2 + 3$, $g(x) = \sqrt{x} - 3$ 4) _____

5) $f(x) = \sqrt{x}$, $g(x) = x^2$ 5) _____

6) $f(x) = x^3 + 7$, $g(x) = \sqrt[3]{x-7}$ 6) _____

Find functions f and g so that $f \circ g = H$.

7) $H(x) = (5 - 2x^3)^2$ 7) _____

8) $H(x) = \frac{6}{\sqrt{2x+9}}$ 8) _____

Find the domain of the composite function $f \circ g$.

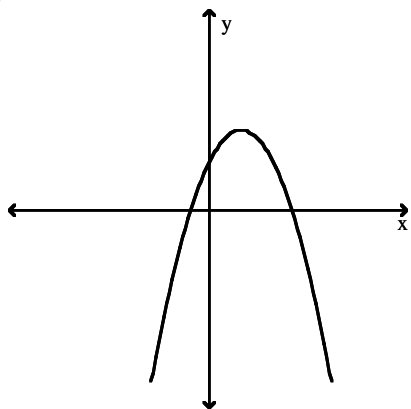
9) $f(x) = \frac{-7}{x-3}$; $g(x) = \frac{-18}{x}$ 9) _____

10) $f(x) = \frac{x}{x+1}$; $g(x) = \frac{1}{x+5}$ 10) _____

11) $f(x) = \sqrt{x}$; $g(x) = 2x + 6$ 11) _____

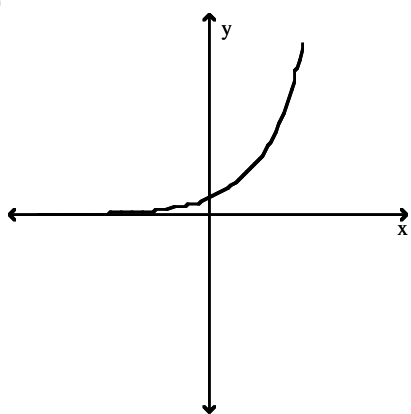
Use the horizontal line test to determine whether the function is one-to-one.

12)



12) _____

13)

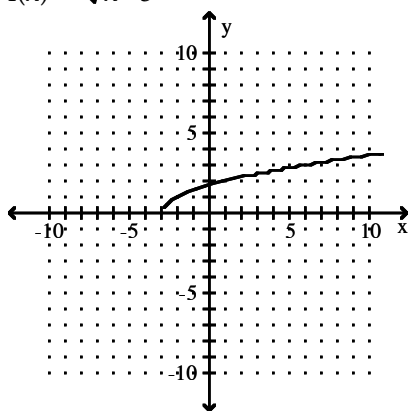


13) _____

The graph of a one-to-one function f is given. Draw the graph of the inverse function f^{-1} as a dashed line or curve.

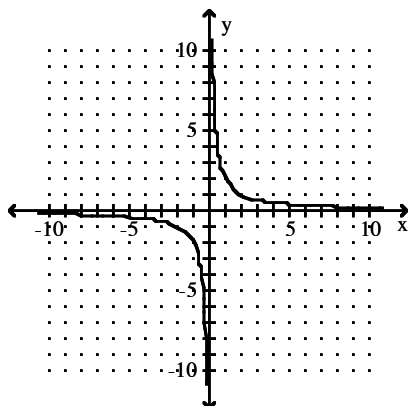
14) $f(x) = \sqrt{x+3}$

14) _____



15) $f(x) = \frac{2}{x}$

15) _____



The function f is one-to-one. Find its inverse.

16) $f(x) = 5x + 2$

16) _____

17) $f(x) = x^2 - 6, x \geq 0$

17) _____

18) $f(x) = \frac{-4x + 5}{-9x + 8}$

18) _____

Find the inverse function of f . State the domain and range of f .

19) $f(x) = \frac{3x - 2}{x + 5}$

19) _____

Determine i) the domain of the function, ii) the range of the function, iii) the domain of the inverse, and iv) the range of the inverse.

20) $f(x) = \frac{1}{x - 4}$

20) _____

21) $f(x) = \sqrt{1 - 2x}$

21) _____

22) If $4^{-x} = \frac{1}{3}$, what does 16^x equal?

22) _____

23) If $9^x = 6$, what does 9^{-3x} equal?

23) _____

Use transformations to graph the function. Determine the domain, range, and horizontal asymptote of the function.

24) $f(x) = -2^{x+3} + 4$

24) _____

25) $f(x) = 5^{(x+3)} - 1$

25) _____

Answer Key

Testname: MATH_1_HW6

1) $24x + 5$

2) $\frac{40x}{1 - 16x}$

3) $x^4 + 8x^2 + 10$

4) No, no

5) Yes, yes

6) Yes, yes

7) $f(x) = x^2$; $g(x) = 5 - 2x^3$

8) $f(x) = \frac{6}{\sqrt{x}}$; $g(x) = 2x + 9$

9) $\{x \mid x \neq 0, x \neq -6\}$

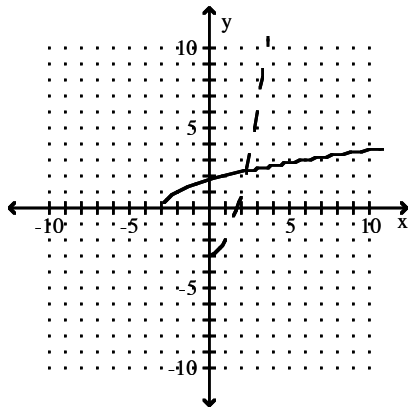
10) $\{x \mid x \neq -5, x \neq -6\}$

11) $\{x \mid x \geq -3\}$

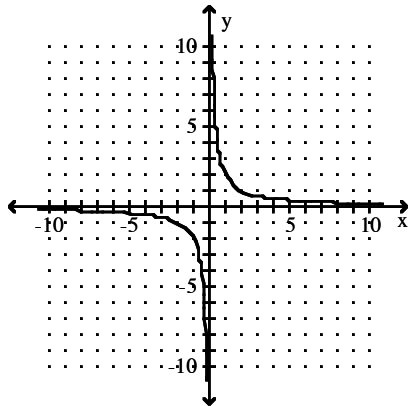
12) No

13) Yes

14)



15) Function is its own inverse



16) $f^{-1}(x) = \frac{x - 2}{5}$

17) $f^{-1}(x) = \sqrt{x + 6}$, $x \geq -6$

18) $f^{-1}(x) = \frac{-8x + 5}{-9x + 4}$

Answer Key

Testname: MATH_1_HW6

19) $f^{-1}(x) = \frac{5x+2}{3-x}$; domain of f : $\{x \mid x \neq -5\}$; range of f : $\{y \mid y \neq 3\}$

20) $f(x)$: $D = \{x \mid x \neq 4\}$, $R = \{y \neq 0\}$;

$f^{-1}(x)$: $D = \{x \mid x \neq 0\}$, $R = \{y \mid y \neq 4\}$

21) $f(x)$: $D = \left\{x \mid x \leq \frac{1}{2}\right\}$, $R = \{y \mid y \geq 0\}$;

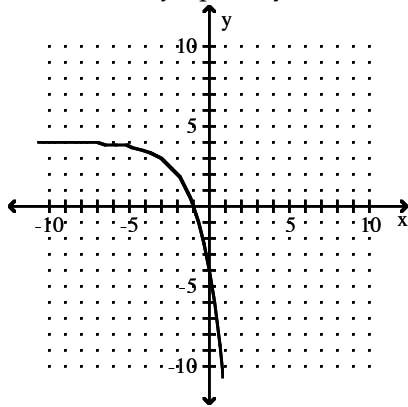
$f^{-1}(x)$: $D = \{x \mid x \geq 0\}$, $R = \left\{y \mid y \leq \frac{1}{2}\right\}$

22) 9

23) $\frac{1}{216}$

24) domain of f : $(-\infty, \infty)$; range of f : $(-\infty, 4)$;

horizontal asymptote: $y = 4$



25)

