

PMATH 12 - CHAPTER 4 - PRETEST

signature _____

Multiple Choice - PART 1 - NON-CALCULATOR - 10 MINUTES (#1-5)

CIRCLE the choice that best completes the statement or answers the question.

1. Given $f(x) = x - 1$ and $g(x) = 3x^2 + 2$, what is an explicit equation for $p(x) = f(x) \cdot g(x)$?

A. $p(x) = 4x^3 + 3x^2 + 2x - 2$

C. $p(x) = 3x^2 - x - 2$

B. $p(x) = 3x^2 + x + 1$

D. $p(x) = 3x^3 - 3x^2 + 2x - 2$

2. Given $f(x) = x + 2$ and $g(x) = x^2 - 25$, what is the domain of $q(x) = \frac{f(x)}{g(x)}$?

A. $x \neq 25$

B. $x \neq 5, x \neq -5$

C. $x \neq -2$

D. $x \in \mathbb{R}$

3. Given $h(x) = 5x^2 + 2x - 3$, which pair of equations below are possible equations for $f(x)$ and $g(x)$ so that $h(x) = f(x) - g(x)$?

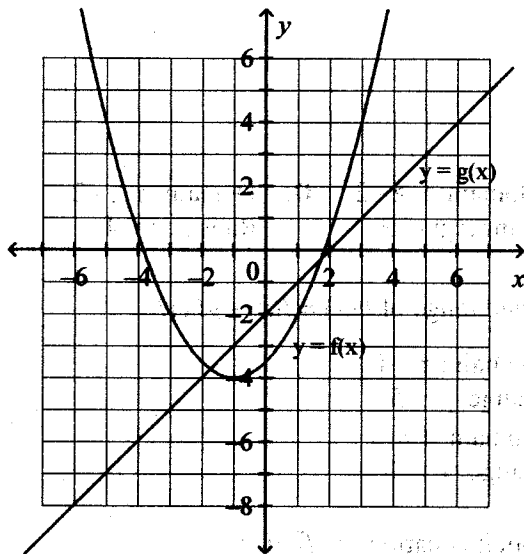
A. $f(x) = 5x^2$
 $g(x) = 2x - 3$

C. $f(x) = 4x^2$
 $g(x) = -x^2 - 2x - 3$

B. $f(x) = 4x^2$
 $g(x) = x^2 + 2x - 3$

D. $f(x) = 5x^2$
 $g(x) = -2x + 3$

4. Given the graphs of $y = f(x)$ and $y = g(x)$, what is the value of $f(g(3))$?



A. 4

B. -2

C. 2

D. -4

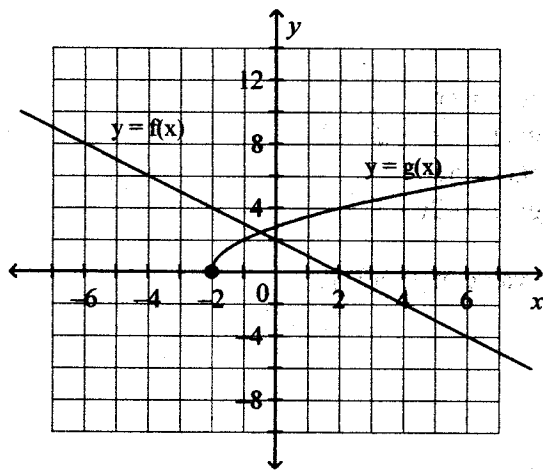
5. Use these tables. What is the value of $f(f(0))$?

x	$f(x)$
-3	18
-2	11
-1	6
0	3
1	2
2	3
3	6

- A. -2 B. 6 C. 2 D. 0

MULTIPLE CHOICE - PART 2 - CALCULATOR may be used after 10 minutes

6. Use the graphs of $y = f(x)$ and $y = g(x)$. What are the domain and range of $y = f(x) - g(x)$?



- A. Domain: $x \in \mathbb{R}$
Range: $y \leq -2$
- B. Domain: $x \leq -2$
Range: $y \leq 4$
- C. Domain: $x \geq -2$
Range: $y \in \mathbb{R}$
- D. Domain: $x \geq -2$
Range: $y \leq 4$

7. Given $f(x) = |x - 5|$ and $g(x) = \frac{1}{x}$, what is the domain and range of $h(x) = f(x) + g(x)$?

- A. Domain: $x \neq 0$
Range: $y \in \mathbb{R}$
- B. Domain: $x \geq 5$
Range: $y \leq 5$
- C. Domain: $x \neq 0$
Range: $y \leq 5$
- D. Domain: $x \neq 5$
Range: $y \in \mathbb{R}$

8. Given $f(x) = \sqrt{4-x}$ and $g(x) = 3-5x$, what is an explicit equation for $f(g(x))$?

- A. $f(g(x)) = 3 - \sqrt{4-5x}$
- B. $f(g(x)) = 1 - \sqrt{4-5x}$
- C. $f(g(x)) = \sqrt{1-5x}$
- D. $f(g(x)) = \sqrt{5x+1}$

9. The function $h(x) = g(f(x))$ is the composite of $f(x) = 2 - x$ and $g(x) = \frac{1}{\sqrt{x}}$.

What is the domain of $h(x)$?

- A. $-2 < x < 0$ B. $x < 2$ C. $x < -2$ or $x > 0$ D. $x > 0$

10. Given $f(x) = \sqrt{2-x}$ and $g(x) = x^2 + 6x - 3$, which is an explicit equation for the composite function $h(x) = g(f(x))$, and what is its domain?

A. $h(x) = \sqrt{-x^2 - 6x + 5}$
 $x \geq 0$

C. $h(x) = \sqrt{-1-x}$
 $x \leq -1$

B. $h(x) = -1 - x$
 $x \in \mathbb{R}$

D. $h(x) = -1 - x + 6\sqrt{2-x}$
 $x \leq 2$

Short Answer - Show your work

1. Given $f(x) = 3x^2 - 1$, $g(x) = x - 4$, and $h(x) = 1 - x^3$, write an explicit equation for $k(x) = f(x) \cdot g(x) - h(x)$, then state its domain.

2. Given $f(x) = \sqrt{x+4}$ and $g(x) = (x-9)^2$, write an explicit equation for $q(x) = \frac{f(x)}{g(x)}$, then determine its domain.

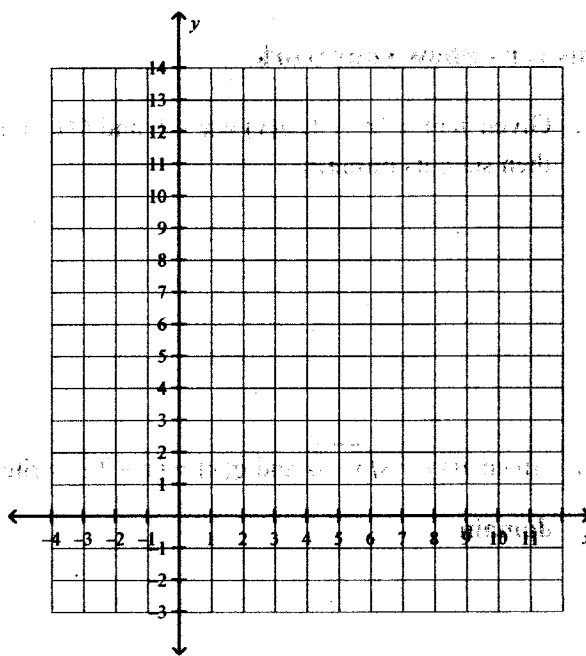
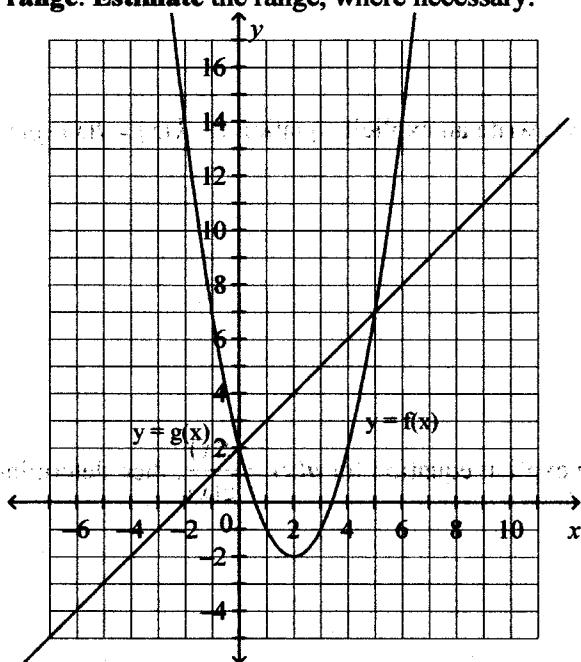
3. Given the functions $f(x) = 2x + 2$ and $g(x) = \sqrt{x+3}$, determine an explicit equation for $g(f(x))$; then state its domain.

4. Given the functions $f(x) = 2x - 4$ and $g(x) = x^2 - 1$, determine each value below.

a) $g(f(1))$

b) $g(g(1))$

5. Use the graphs of $y = f(x)$ and $y = g(x)$ to sketch the graph of $y = f(x) + g(x)$, then identify its domain and range. Estimate the range, where necessary.



x	f(x)	g(x)	f+g	
				domain of new graph
				range of new graph

6. Given $f(x) = \frac{x-2}{4}$ and $g(x) = 2x^2 + 4$, determine an explicit equation for $f(g(x))$, then state its domain and range.

Problem - Show your work

1. Given $q(x) = x^2 - 1$, write explicit equations for two functions $f(x)$ and $g(x)$ so that $q(x) = \frac{f(x)}{g(x)}$. Explain your strategy.

2. Given $f(x) = 2x + 1$ and $g(x) = x^3 - 3$, determine an explicit equation for each composite function, then state its domain and range.

a) $f(g(x))$

domain

range

b) $g(f(x))$

domain

range