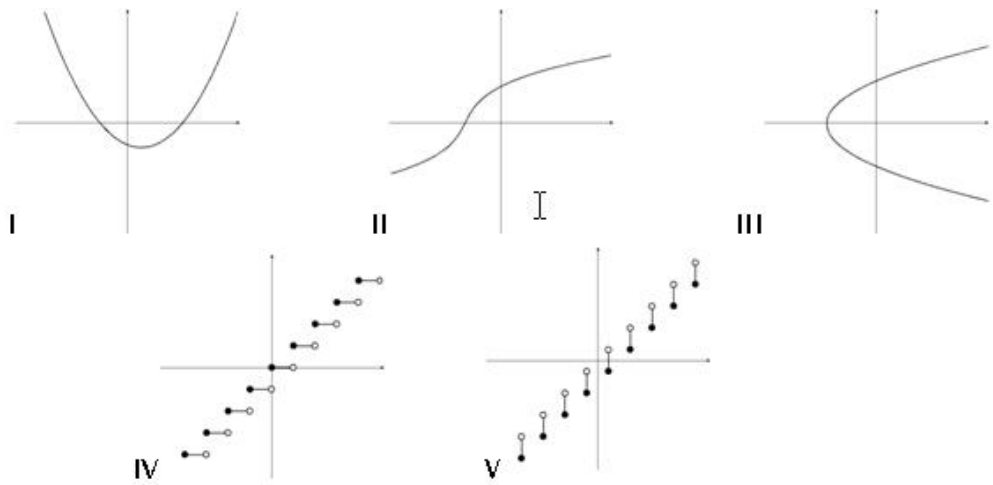
# Math 103 Pre-Calc Review Part 2 - Due Fri. Sept. 13th

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1. Find the largest value in the domain of the function $f(x) = \sqrt{\dfrac{3-2x}{4+3x}}$.

a. $-\dfrac{3}{2}$
b. $-\dfrac{2}{3}$
c. 0
d. 2
e. $\dfrac{2}{3}$
f. $\dfrac{3}{2}$
g. 3
h. No largest value

____ 2. Which of the following are graphs of functions?




a. I only
b. II only
c. III only
d. I and II only
e. I and III only
f. I, II, and IV only
g. II and V only
h. I,II, III only

____ 3. Let $f(x) = x^2 - 3x + 7$, then $f(2x)$ is equal to

a. $2x^2 - 6x + 7$
b. $4x^2 - 6x + 7$
c. $2x^2 - 6x + 14$
d. $4x^2 - 3x + 7$
e. $2x^2 + 6x - 7$
f. $4x^2 + 6x - 7$
g. $2x^2 - 3x + 7$
h. $4x^2 - 6x + 14$

____ 4. Let $f(x) = 2 - x^3$ and $g(x) = 3 + x$. Find the value of $(f \circ g)(x)$ when $x = -5$.

a. −510
b. −5
c. −2
d. 0
e. 5
f. 10
g. 127
h. 130

____ 5. Relative to the graph of $y = x^3$, the graph of $y = \frac{1}{2}x^3$ is changed in what way?

a. Compressed horizontally by a factor of 2
b. Shifted 2 units downward
c. Stretched vertically by a factor of 2
d. Stretched horizontally by a factor of 2
e. Shifted 2 units upward
f. Compressed vertically by a factor of 2
g. Shifted 2 units to the right
h. Shifted 2 units to the left

____ 6. Relative to the graph of $y = x^2$, the graph of $y = x^2 - 2$ is changed in what way?

a. Shifted 2 units downward
b. Stretched horizontally by a factor of 2
c. Shifted 2 units to the right
d. Stretched vertically by a factor of 2
e. Compressed horizontally by a factor of 2
f. Compressed vertically by a factor of 2
g. Stretched vertically by a factor of 2
h. Stretched horizontally by a factor of 2

____ 7. Relative to the graph of $y = e^x$, the graph of $y = e^{x+5}$ is changed in what way?

a. Shifted 5 units upward
b. Shifted 5 units downward
c. Shifted 5 units to the right
d. Shifted 5 units to the left
e. Stretched horizontally by a factor of 5
f. Stretched vertically by a factor of 5
g. Compressed horizontally by a factor of 5
h. Compressed vertically by a factor of 5

____ 8. For what value of $x$ is $3^{4-x} = \sqrt{3}$?

a. 0
b. $\frac{1}{2}$
c. 1
d. $\frac{3}{2}$
e. 2
f. $\frac{5}{2}$
g. 3
h. $\frac{7}{2}$

____ 9. Find the value of $\log_2 \frac{1}{8}$.

a. $\frac{1}{4}$
b. $\frac{1}{3}$
c. 0
d. 1
e. −1
f. 2
g. −2
h. −3

____ 10. Find the value of ln $\sqrt{e^3}$.

a. $\frac{2}{3}$
b. $\sqrt{e}$
c. $e^3/2$
d. $\frac{3}{2}$
e. $e^3$
f. $e^3-2$
g. $2e/3$
h. $2/e^3$

____ 11. Find the value of $e^{3\ln 2}$.

a. $\frac{2}{3}$
b. $\frac{3}{2}$
c. 5
d. 6
e. 8
f. 9
g. 12
h. 18

____ 12. Find the value of $\log_2 e - \log_2(e/16)$.

a. $-2$
b. $e^{-2}$
c. 4
d. $e^{16}$
e. $-4$
f. $e^2$
g. 2
h. $e^{-16}$

____ 13. Solve the equation $e^{2-3x} = 125$.

a. $x = 2 - \ln 5$
b. $x = 2 - 3\ln 5$
c. $x = \frac{2}{3} - \ln 5$
d. $x = \frac{2}{3} - 3\ln 5$
e. $x = -\ln 5$
f. $x = -\frac{1}{3}\ln 5$
g. $x = \frac{2}{3}\ln 5$
h. $x = 2 + 3\ln 5$

____ 14. Solve the equation $\log_9(\ln x^3)=1$

a. $x = 3^e$
b. $x = 3e$
c. $x = e/3$
d. $x = 1$
e. $x = e^2$
f. $x = 1/e$
g. $x = 3/e$
h. $x = e^3$

____ 15. Find the exact value of $\tan\left(\cos^{-1}\frac{\sqrt{2}}{2}\right)$.

a. 1
b. $\sqrt{3}$
c. $\sqrt{2}$
d. $\frac{\sqrt{2}}{2}$
e. 0
f. $\frac{\pi}{4}$
g. $\frac{\pi}{3}$
h. $\frac{\pi}{6}$

____ 16. Find the exact value of $\tan^{-1}(\cos \pi)$.

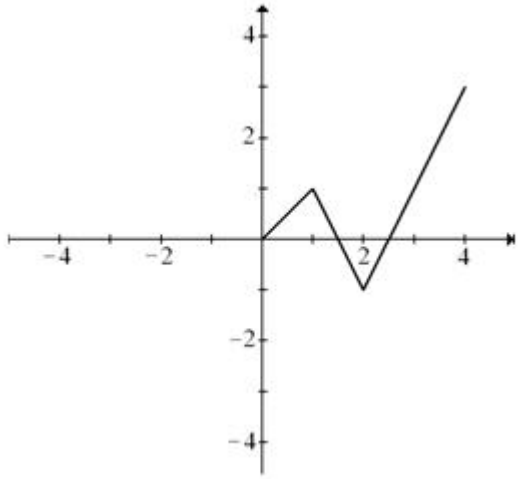
a. $-\frac{\pi}{2}$
b. $-\frac{\pi}{4}$
c. 0
d. $\frac{\pi}{4}$
e. $\frac{3\pi}{4}$
f. $\frac{5\pi}{6}$
g. $\frac{\pi}{2}$
h. $\pi$

**Short Answer**

17. Each of the functions in the table below is increasing, but each increases in a different way. Select the graph from those given below which best fits each function:

| *t* | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| ***f (t)*** | 26 | 34 | 41 | 46 | 48 | 49 |
| ***g (t)*** | 16 | 24 | 32 | 40 | 48 | 56 |
| ***h (t)*** | 36 | 44 | 53 | 64 | 77 | 93 |

18.A function has a domain [–4, 4] and a portion of its graph is shown.




(a) Complete the graph of $f$ of its is known that $f$ is an even function.

(b) Complete the graph of $f$ if it is known that $f$ is an odd function.

19. $f$ and $g$ are functions defined by the following table.

| $x$ | −3 | −2 | −1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|
| $f(x)$ | −5 | −4 | −3 | −2 | −1 | −2 | −3 |
| $g(x)$ | _4 | 1 | −1 | −2 | −1 | 1 | 4 |

Determine the following:

(a) $(f + g)(2)$

(b) $(f - g)(-1)$

(c) $(f \cdot g)(0)$

(d) $(f / g)(3)$

(e) $(f \circ g)(-2)$

(f) $(f \circ f)(0)$

(g) $(g \circ f)(-1)$

(h) $(g \circ g)(-2)$

20. Evaluate the difference quotient $\frac{f(x)-f(a)}{x-a}$ for $f(x) = \frac{1}{x^2}$.

**Spring 2011**

1. Evaluate the following limit.

$$\lim_{h \to 0} \left( \frac{1}{h} - \frac{1}{h^2 + h} \right)$$

A) $-\infty$ B) $-2$ C) $-1$ D) $0$

E) $1$ F) $2$ G) $\infty$ H) Does not exist.

**Spring 2010**

2. Find the value of the limit $\lim_{x \to 1} \frac{2x^2 + x - 3}{x^2 - x}$.

a. 5

b. 4

c. 3

d. 2

e. $\frac{7}{2}$

f. $\frac{3}{2}$

g. $\frac{1}{2}$

h. 0

**Spring 2010**

3. Find the value of the limit $\lim_{x \to 1} \frac{x-1}{\sqrt{x}-1}$.

a. $\sqrt{2}$
b. 1
c. –1
d. $-\sqrt{2}$
e. 2
f. –4
g. 4
h. –2

**Fall 2008**

5. Find the value of the limit.

$$\lim_{x \to 2} \frac{\sqrt{x+7}-3}{(x-2)(x+1)}$$

A) 0 B) $\frac{1}{3}$ C) $\frac{1}{9}$ D) $\frac{1}{27}$ E) $\frac{1}{18}$ F) Does not exist

# Math 103 Pre-Calc Review Part 2 - Due Fri. Sept. 23rd
# Answer Section

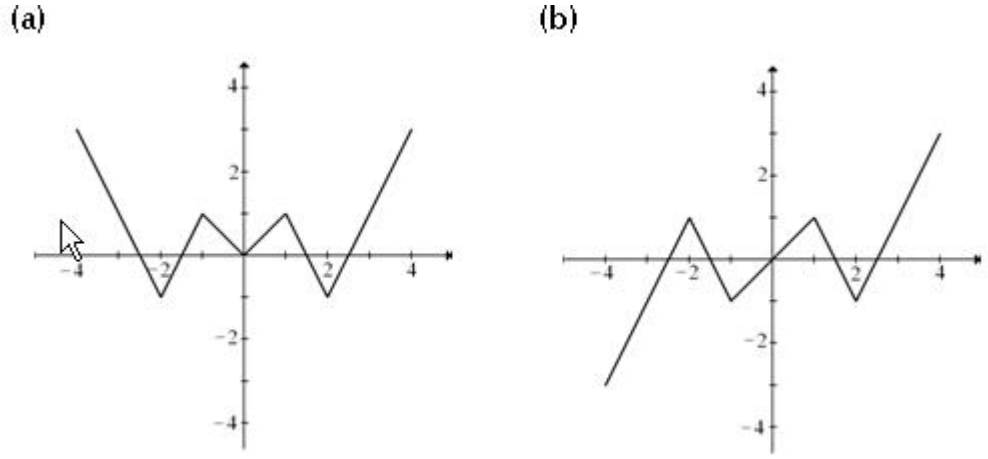
## MULTIPLE CHOICE

| | | |
|---|---|---|
| 1. | ANS: F | PTS: 1 |
| 2. | ANS: F | PTS: 1 |
| 3. | ANS: B | PTS: 1 |
| 4. | ANS: F | PTS: 1 |
| 5. | ANS: F | PTS: 1 |
| 6. | ANS: A | PTS: 1 |
| 7. | ANS: D | PTS: 1 |
| 8. | ANS: H | PTS: 1 |
| 9. | ANS: H | PTS: 1 |
| 10. | ANS: D | PTS: 1 |
| 11. | ANS: E | PTS: 1 |
| 12. | ANS: C | PTS: 1 |
| 13. | ANS: C | PTS: 1 |
| 14. | ANS: H | PTS: 1 |
| 15. | ANS: A | PTS: 1 |
| 16. | ANS: B | PTS: 1 |

## SHORT ANSWER

17. ANS:
    $f(t)$: (B)
    $g(t)$: (A)
    $h(t)$: (C)

    PTS: 1
18. ANS:




PTS: 1

19. ANS:
(a) $-1$
(b) $-2$
(c) $4$
(d) $-\frac{3}{4}$
(e) $-1$
(f) $-4$
(g) $4$
(h) $-1$

PTS: 1

20. ANS:
$$\frac{f(x)-f(a)}{x-a} = \frac{-a-x}{a^2x^2}$$

PTS: 1

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**Spring 2011 # 1: E**

**Spring 2010 # 2: A**

**Spring 2010 # 3: E**

**Fall 2008 # 5: E**