

Name: _____

Section: _____

Last 4 digits of student ID #: _____

This exam has ten multiple choice questions (five points each) and five free response questions (ten points each). Additional blank sheets are available if necessary for scratch work. No books or notes may be used. Turn off your cell phones and do not wear ear-plugs during the exam. You may use a calculator, but not one which has symbolic manipulation capabilities.

On the multiple choice problems:

1. You must give your *final answers* in the *multiple choice answer box* on the front page of your exam. See the “EXAMPLE” row for a correct shading example.
2. Carefully check your answers. No credit will be given for answers other than those indicated on the *multiple choice answer box*.

On the free response problems:

1. Clearly indicate your answer and the reasoning used to arrive at that answer (*unsupported answers may not receive credit*),
2. Give exact answers, rather than decimal approximations to the answer (unless otherwise stated).

Each free response question is followed by space to write your answer. Please write your solutions neatly in the space below the question. You are not expected to write your solution next to the statement of the question.

Multiple Choice Answers

EXAMPLE	A	B	C	D	E
Question					
1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E

Exam Scores

Question	Score	Total
MC		50
11		10
12		10
13		10
14		10
15		10
Total		100

Record the correct answer to the following problems on the front page of this exam.

1. Write an inequality that is satisfied by those numbers x whose distance from -2 is greater than 7.

- (A) $|x + 2| < 7$
- (B) $|x + 2| > 7$
- (C) $|x - 2| < 7$
- (D) $|x - 2| > 7$
- (E) $|x + 2| \leq 7$

2. Solve the equation for c ,

$$2A = \frac{b + 2c}{h}.$$

- (A) $c = \frac{A - b}{2h}$
- (B) $c = \frac{2A - b}{h}$
- (C) $c = \frac{Ah - b}{2}$
- (D) $c = \frac{2Ah - b}{2}$
- (E) $c = \frac{2Ah - bh}{2}$

3. Find the center and radius of the circle $x^2 + 6x + y^2 + 8y = 0$.

- (A) center: $(-3, -4)$, radius: 5
- (B) center: $(3, 4)$, radius: 5
- (C) center: $(3, 4)$, radius: 25
- (D) center: $(-3, -4)$, radius: 25
- (E) center: $(-3, 4)$, radius: 25

Record the correct answer to the following problems on the front page of this exam.

4. Find the slope and the y -intercept for the line given by the equation

$$2x + 3y = 9.$$

- (A) slope of $-2/3$ and y -intercept of 3
- (B) slope of $2/3$ and y -intercept of 3
- (C) slope of $2/3$ and y -intercept of -3
- (D) slope of $-3/2$ and y -intercept of 3
- (E) slope of $3/2$ and y -intercept of -3

5. How many real solutions are there for the equation

$$x^3 + 200x^2 + 111 = 200x^2 - 2000?$$

- (A) 0
- (B) 1
- (C) 2
- (D) 3
- (E) 4

Record the correct answer to the following problems on the front page of this exam.

6. The area of a rectangle whose sides are ℓ and w is $A = \ell \cdot w$. If we know that the sum of ℓ and w is 15, find a function that gives the area in terms of w .

- (A) $A(w) = 15w$
- (B) $A(w) = 15w + w^2$
- (C) $A(w) = 15 - w$
- (D) $A(w) = 15w - w^2$
- (E) $A(w) = w^2 - 15w$

7. Consider the equation

$$y + x^2 = 10.$$

Which of the following is correct.

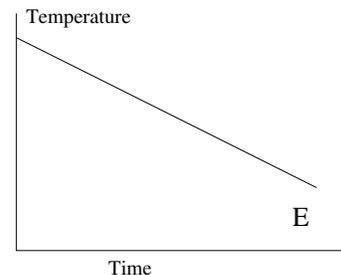
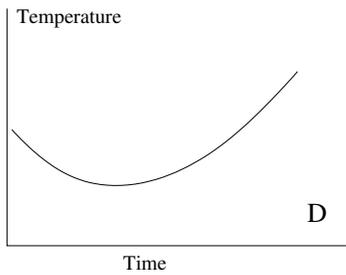
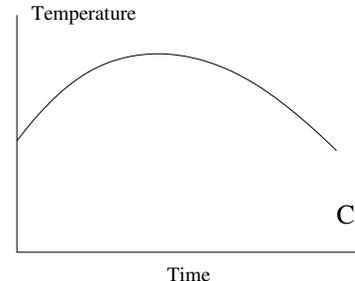
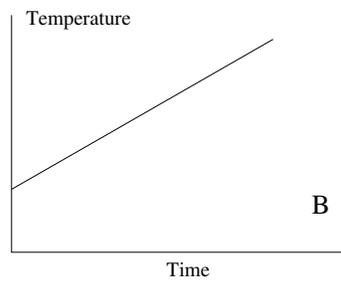
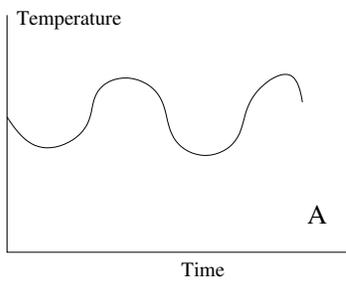
- (A) This equation defines x as a function of y , but does not define y as a function of x .
- (B) This equation defines x a function of y and defines y as a function of x .
- (C) This equation defines y as a function of x , but does not define x as a function of y .
- (D) This equation does not define y as a function of x and does not define x as a function of y .
- (E) None of the above options is correct.

Record the correct answer to the following problems on the front page of this exam.

8. Suppose that $f(x) = x^2 + 3$. Find $f(x + 2)$ and simplify your answer.

- (A) $x^2 + 7$
- (B) $x^2 + 5$
- (C) $x^2 + 4x + 5$
- (D) $x^2 + 4x + 4$
- (E) $x^2 + 4x + 7$

9. Consider the five graphs below. Which of these best describes the temperature as a function of time over a period of two days?



10. Consider the piecewise defined function given by

$$f(x) = \begin{cases} 1/|x|, & x \leq -1 \\ 1 + x, & -1 < x < 2 \\ 3 - x^2, & x \geq 2 \end{cases}$$

Find $f(-1)$ and $f(1)$.

- (A) $f(-1) = 0$ and $f(1) = 2$
- (B) $f(-1) = 1$ and $f(1) = 1$
- (C) $f(-1) = 1$ and $f(1) = 2$
- (D) $f(-1) = 2$ and $f(1) = 2$
- (E) $f(-1) = 0$ and $f(1) = 1$

Free Response Questions: Show your work!

11. Suppose that a point P lies on the y -axis and is 13 units distance from the point $(5, 7)$.
- (a) Let y denote the y -coordinate of the point P . Write an equation for y .
 - (b) Solve the equation from part a) to find the point or points P that are on the y -axis and are 13 units from point $(5, 7)$.

Free Response Questions: Show your work!

12. Verimobile cell phone company offers two text messaging plans. Plan T costs \$22 and \$0.02 for each message, while Plan V has a fixed charge of \$9 and then adds \$0.04 for each message.
- (a) Write two linear equations which give the total cost C for sending n text messages under each plan.
 - (b) For which value of n do the two plans have the same cost?
 - (c) For which values of n is Plan T less expensive?

Free Response Questions: Show your work!

13. Find all solutions of the equations below. You must use algebraic methods and show your work. ONLY **exact answers** will receive full credit!

(a)

$$|x| = 2 - 3x$$

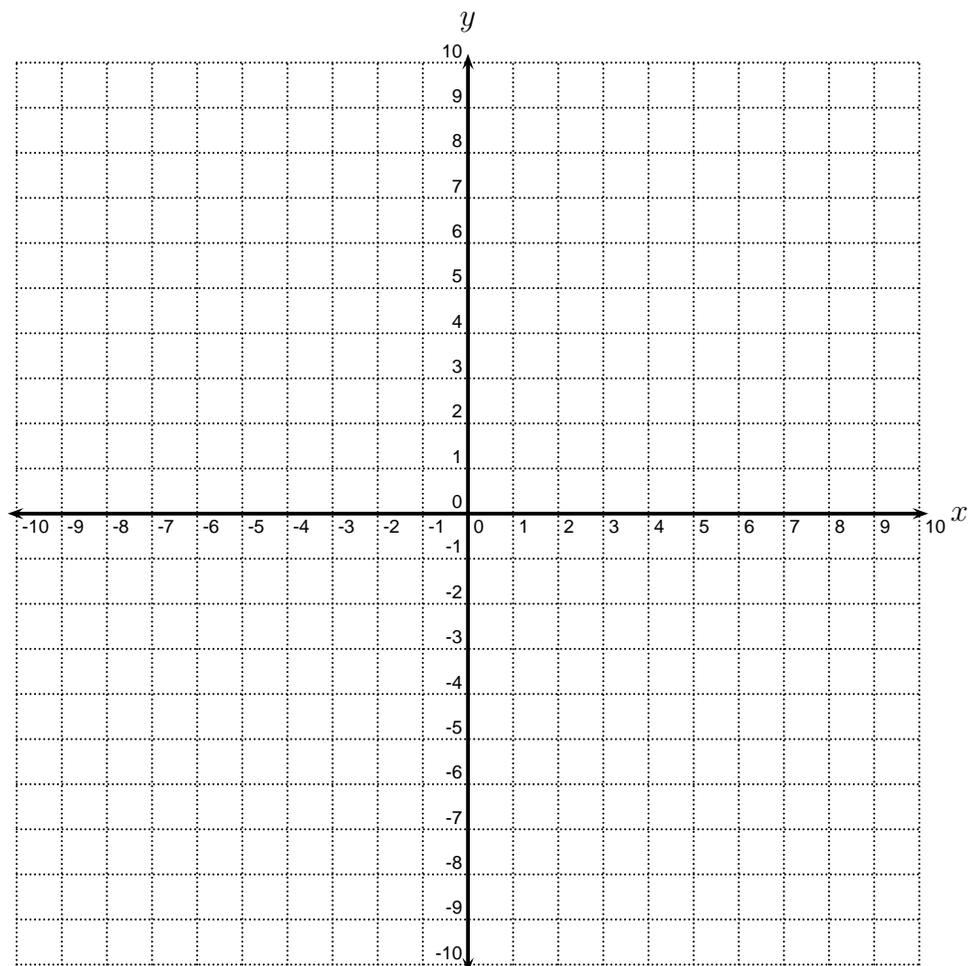
(b)

$$\frac{x}{x+2} = \frac{1}{x-5}$$

Free Response Questions: Show your work!

14. Graph the function

$$f(x) = \begin{cases} |x + 1|, & x \leq 1 \\ 4 - x^2, & x > 1 \end{cases}$$



Free Response Questions: Show your work!

15. Consider the function

$$f(x) = \frac{\sqrt{2x+4}}{x-1}$$

(a) Find $f(0)$ and $f(6)$.

(b) Find the domain of f and explain your reasoning. Give your answer using interval notation.