Do not remove this answer page — you will turn in the entire exam. You have two hours to do this exam. No books or notes may be used. You may use a graphing calculator during the exam, but NO calculator with a Computer Algebra System (CAS) or a QWERTY keyboard is permitted. Absolutely no cell phone use during the exam is allowed.

The exam consists of multiple choice and short answer questions. Record your answers on this page. For each multiple choice question, you will need to fill in the box corresponding to the correct answer. For example, if (a) is correct, you must write

| a | b | c | d | e |

Do not circle answers on this page, but please do circle the letter of each correct response in the body of the exam. It is your responsibility to make it CLEAR which response has been chosen. You will not get credit unless the correct answer has been marked on both this page and in the body of the exam.

GOOD LUCK!

1.	a b c d e		10.	a b c d e
2.	a b c d e		11.	a b c d e
3.	a b c d e		12.	a b c d e
4.	a b c d e		13.	a b c d e
5.	a b c d e		14.	
6.	a b c d e		15.	
7.	a b c d e		16.	
8.	a b c d e		17.	
9.	a b c d e		18.	

For grading use:

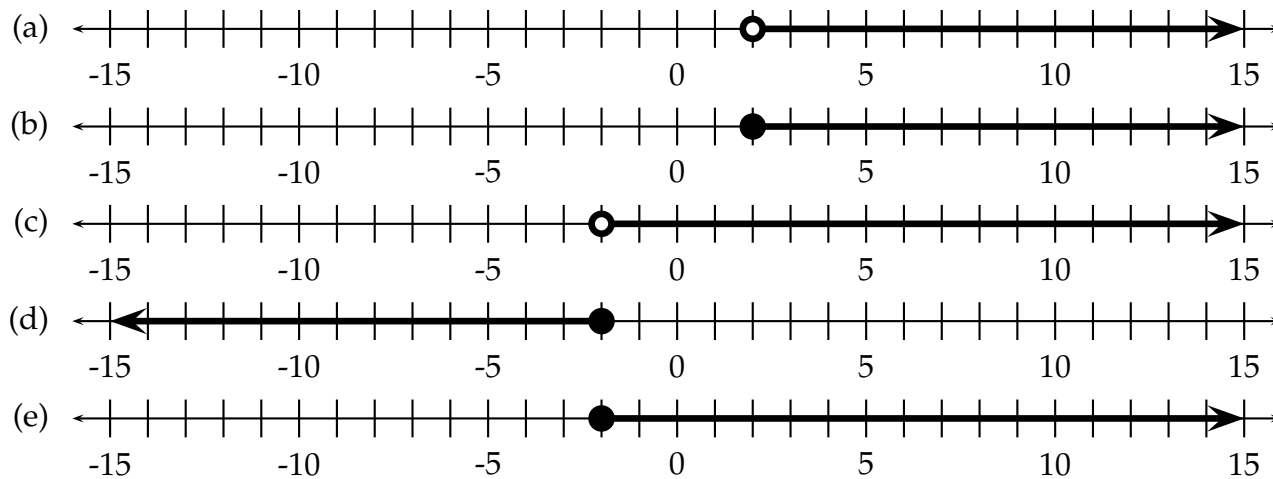| Total	
	(out of 90 pts)

Multiple Choice Questions

Show all your work on the page where the question appears.
Clearly mark your answer both on the cover page of this exam
and in the corresponding questions that follow.

1. Solve the inequality and graph the solution set on the real number line.

$$11 - 2x \geq 15$$

Possibilities:

2. Which of the following windows is an appropriate viewing window for $y = 4x^2 + 80x + 350$?

Possibilities:

(a) $-10 \leq x \leq 10, -100 \leq y \leq 100$

(b) $-5 \leq x \leq 25, 0 \leq y \leq 20$

(c) $-20 \leq x \leq 5, -60 \leq y \leq 100$

(d) $-10 \leq x \leq 10, -10 \leq y \leq 10$

(e) None of the above windows gives a complete graph.

3. Solve the inequality $x^2 + 4x - 49 \geq -4$. Write the solution set in interval notation.

   Possibilities:

   (a) $(-\infty, -9] \cup [5, \infty)$

   (b) $(-\infty, -4]$

   (c) $[-4, \infty)$

   (d) $(-\infty, -5] \cup [9, \infty)$

   (e) $[-9, 5]$

4. Let $f(x) = \dfrac{1}{x^2 - 3x - 10}$. Find the domain of $f(x)$.

   Possibilities:

   (a) $(-\infty, 10) \cup (10, \infty)$

   (b) $(-\infty, -2) \cup (-2, 5) \cup (5, \infty)$

   (c) $(-\infty, -5) \cup (-5, 2) \cup (2, \infty)$

   (d) $(-\infty, -10) \cup (-10, \infty)$

   (e) $(-2, 5)$

5. A rectangle has an area of 80 square feet and a perimeter of 64 feet. Which system of equations would you solve to find the length l and width w of the rectangle?

   Possibilities:

   (a) $\begin{cases} lw = 64 \\ l + w = 80 \end{cases}$

   (b) $\begin{cases} lw = 64 \\ 2l + 2w = 80 \end{cases}$

   (c) $\begin{cases} lw = 80 \\ 2l + 2w = 64 \end{cases}$

   (d) $\begin{cases} lw = 80 \\ l + w = 64 \end{cases}$

   (e) $\begin{cases} 2lw = 80 \\ l + w = 64 \end{cases}$

6. Suppose you need to solve a system of two equations in which one equation represents a circle and the other represents a line. How many solutions could your system have?

Possibilities:

(a) The system could only have 0, 1, or 2 solutions.

(b) The system could only have 0, 1, or infinitely many solutions.

(c) The system could only have 1, 2, or 3 solutions.

(d) The system could only have 1 or 2 solutions.

(e) The system could only have 0 or 1 solutions.

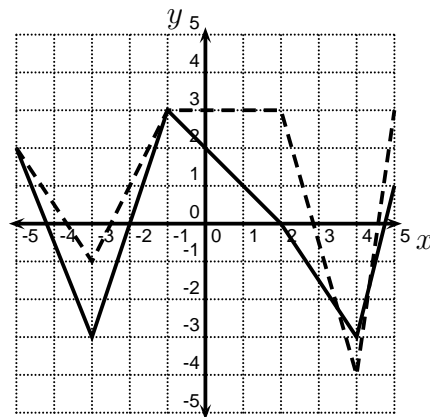7. Solve the inequality.
$$|x + 4| > 7$$

Possibilities:

(a) $(-\infty, -11) \cup (3, \infty)$

(b) $(-\infty, 3)$

(c) $(-\infty, -11)$

(d) $(3, \infty)$

(e) $(-\infty, -7) \cup (7, \infty)$

8. What quantity, x, of a 30% acid solution must be mixed with 1700 mL of a 55% acid solution to produce a 47% solution?

Possibilities:

(a) 900 mL

(b) 700 mL

(c) 500 mL

(d) 600 mL

(e) 800 mL

9. In the picture below, the graph of $y = f(x)$ is the solid graph, and the graph of $y = g(x)$ is the dashed graph. Find the true statement.

Possibilities:

(a) $f(-3) < g(-3)$

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

(c) $f(-1) = 2$

(d) $f(2) \geq g(2)$

(e) $f(4) = -4$

10. How many solutions does the following system of equations have?

$$\begin{cases} 4x + 16y = 32 \\ 6x + 24y = 49 \end{cases}$$

Possibilities:

(a) No solutions

(b) One solution

(c) Two solutions

(d) Three solutions

(e) Infinitely many solutions

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11. Let $f(x) = 2x + 11$. Find $\dfrac{f(4+h) - f(4)}{h}$. Assume $h \neq 0$.

Possibilities:

(a) $\dfrac{2h + 11}{h}$

(b) $\dfrac{30 + 2h - 2x}{h}$

(c) 2

(d) 1

(e) -2

12. If you live in the United States in 2010, and your taxable income, i, is over \$8375 but not over \$34,000, then your federal income tax t, in dollars, is given by

$$t = 837.50 + .15(i - 8375).$$

Each member of one family paid between \$1893.50 and \$2829.50 in federal income taxes. How much money did each family member earn?

Possibilities:

(a) Between \$14415 and \$23155.

(b) Between \$15915 and \$22655.

(c) Between \$15415 and \$21655.

(d) Between \$17915 and \$23155.

(e) Between \$14415 and \$24155.

13. Approximate the solution to $(x - 2)^3 = \dfrac{x}{2}$.

Possibilities:

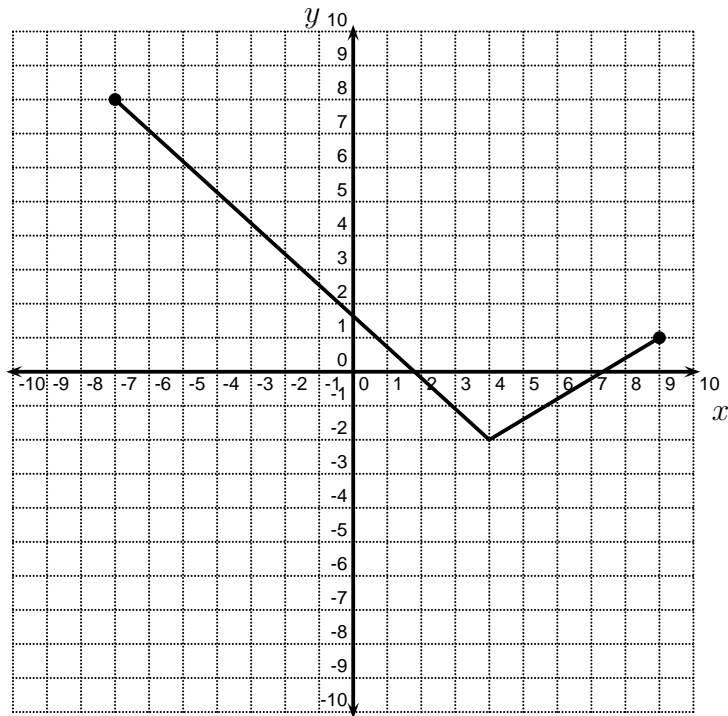(a) $x \approx 1.5765$

(b) $x \approx 3.1654$

(c) $x \approx 3.6818$

(d) $x \approx 1.5827$

(e) $x \approx 3.1531$

14. Let $f(x) = x^2 + 8$. Find $f(x+4)$.

15. The graph of the function f is shown below. Find the domain of f. Be sure to write your answer in interval notation.

16. Find all the solutions of the system of equations, or state that there are no solutions.

$$\begin{cases} -5x - 9y = 9 \\ -4x - 9y = -7 \end{cases}$$

17. Suppose you want to graph $2y + x^2 = 15$ on your graphing calculator. What should you enter into your calculator?

18. A 25 foot ladder rests against a wall. The bottom of the ladder is 7 feet from the wall. If the bottom of the ladder is pulled out 3 feet farther from the wall, how far does the top of the ladder move down from the wall?