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

<center>

| a | b | c | d | e |

</center>

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.

<center>

GOOD LUCK!

</center>

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. _____

<center>

For grading use:

Total	
	(out of 90 pts)

</center>

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.
$$2x^2 - 5x + 1 = 0$$

   Possibilities:

   (a) $\dfrac{5 \pm \sqrt{17}}{4}$

   (b) $\dfrac{-5 \pm \sqrt{33}}{4}$

   (c) $\dfrac{-5}{4} \pm \sqrt{17}$

   (d) $\dfrac{-5 \pm \sqrt{17}}{4}$

   (e) $\dfrac{5 \pm \sqrt{33}}{4}$

2. Which of the following are linear equations.

   (I) $3x + 5 = 7$ **(II)** $y = \dfrac{2x + 1}{3}$ **(III)** $y = 4x^2 - 1$

   Possibilities:

   (a) Only **(I)** and **(II)**.
   (b) Only **(I)** and **(III)**.
   (c) Only **(II)** and **(III)**.
   (d) Only **(I)**.
   (e) Only **(II)**.

3. Find the midpoint of the line segment connecting $A(-5, 10)$ and $B(8, 5)$.

Possibilities:

(a) $(-13/2, 5/2)$

(b) $(13/2, -5/2)$

(c) $(\sqrt{194}, 0)$

(d) $(3/2, 15/2)$

(e) $(0, \sqrt{194})$

4. Find all real solutions.
$$x^3 + 7x^2 - 25x - 150 = x^2$$

Possibilities:

(a) $x = 5$ and $x = -5$

(b) $x = 5$ and $x = 6$

(c) $x = -6$

(d) $x = 5$, $x = -5$, and $x = -6$
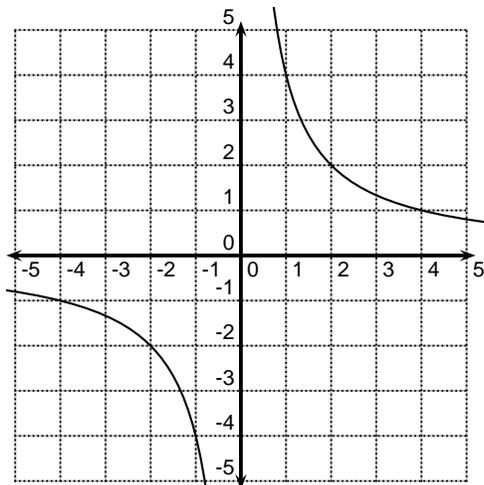
(e) $x = 6$

5. Find all the solutions of the equation.
$$|x - 5| = 3$$

Possibilities:

(a) There are exactly two solutions: $x = -2$ and $x = -8$.

(b) There are exactly two solutions: $x = 2$ and $x = 8$.

(c) The only solution is $x = -2$.

(d) The only solution is $x = 8$.

(e) The equation does not have any solutions.

6. The graph shown is the graph of which of the following equations?

   Possibilities:

   (a) $xy = 4$

   (b) $y = 3x + 4$

   (c) $x = y$

   (d) $(x - 9)^2 + (y - 16)^2 = 144$

   (e) $9y = 16x^3$

7. The distance from x to 2 is 8. Which of the following equations represents this fact?

   Possibilities:

   (a) $|x + 8| = 2$

   (b) $|x| = 10$

   (c) $|x - 8| = 2$

   (d) $|x + 2| = 8$

   (e) $|x - 2| = 8$

8. Rewrite the expression by completing the square.

$$x^2 + 16x + 60$$

   Possibilities:

   (a) $(x + 8)^2$

   (b) $(x + 16)^2 + 60$

   (c) $(x + 8)^2 - 4$

   (d) $(x + 16)^2$

   (e) $(x + 8)^2 + 4$

9. Find all real solutions or state that there are no solutions.

$$\sqrt{x - 9} = x - 11.$$

Possibilities:

(a) $x = 10$

(b) $x = 13$

(c) $x = 9$ or $x = 11$

(d) No Solutions

(e) $x = 13$ or $x = 10$

10. Find the intercept(s) of the graph of $y = x^2 - x - 20$.

Possibilities:

(a) x-intercepts: $(5, 0)$ and $(-4, 0)$
    y-intercept: $(0, 20)$

(b) x-intercept: $(20, 0)$
    y-intercepts: $(0, -5)$ and $(0, 4)$

(c) x-intercepts: $(5, 0)$ and $(-4, 0)$
    y-intercept: $(0, -20)$

(d) x-intercepts: $(-5, 0)$ and $(4, 0)$
    y-intercept: $(0, -20)$

(e) x-intercept: $(-20, 0)$
    y-intercepts: $(0, 5)$ and $(0, -4)$

11. A circle has a diameter with endpoints (8,-7) and (4,-11). Find an equation for the circle.

Possibilities:

(a) $(x - 6)^2 + (y + 9)^2 = 2\sqrt{2}$

(b) $(x - 4)^2 + (y - 2)^2 = 2\sqrt{2}$

(c) $(x - 6)^2 + (y + 9)^2 = 8$

(d) $(x + 6)^2 - (y - 9)^2 = 8$

(e) $(x - 4)^2 + (y - 2)^2 = 8$

12. Find all real solutions.
$$2(x+2)^4 + 10 = 18$$

Possibilities:

(a) $x = \sqrt[4]{10}$

(b) $x = \sqrt[4]{4}$

(c) $x = \sqrt[4]{4} - 2$ and $x = -\sqrt[4]{4} - 2$

(d) $x = \sqrt[4]{4} - 2$

(e) $x = -\sqrt[4]{4} - 2$

13. Find an equation for the line through the points $(-4, 7)$ and $(3, 13)$.

Possibilities:

(a) $y - 4 = -\dfrac{7}{6}(x - 7)$

(b) $y + 7 = \dfrac{6}{7}(x - 4)$

(c) $y - 3 = \dfrac{6}{7}(x - 13)$

(d) $y - 7 = \dfrac{6}{7}(x + 4)$

(e) $y - 13 = -\dfrac{7}{6}(x - 3)$

Short Answer Questions

Clearly write your answers in the spaces provided on the following pages.

14. Find all real solutions or state that there are NONE.
$$\frac{x-5}{3} = -3.$$

15. Find all real solutions or state that there are NONE.
$$\frac{x}{x+5} - \frac{x}{x+2} = \frac{3}{x^2+7x+10}.$$

16. Find all real solutions or state that there are NONE.

$$x^6 + 26x^3 - 27 = 0.$$

17. Find an equation for the line that is perpendicular to $y = \dfrac{5}{6}x + 4$ and passes through the point $(4, 8)$.

18. Solve the equation for a.

$$P = 5a + 4b.$$