

Math 150 Test #5B Print this test. When you have completed this test submit your answers in Test #5B Answers. Remember that work must be shown on questions that are not multiple choice (Part II).

**Part I: Select the letter of the correct answer.**

- 1.) Solve the following system of equations simultaneously **for x**.

$$2x + 3y = 6 \text{ and } 4x - 5y = 2 \quad \mathbf{x} =$$

- A)  $\frac{4}{11}$       B)  $\frac{11}{10}$       C)  $\frac{10}{11}$       D)  $\frac{18}{11}$

- 2.) Solve the following system of equations simultaneously **for y**.

$$x = 5y - 2 \text{ and } 3x + 2y = 7 \quad \mathbf{y} =$$

- A)  $\frac{13}{17}$       B)  $\frac{17}{13}$       C)  $\frac{31}{17}$       D)  $\frac{1}{17}$

- 3.) Solve for x:  $3x^2 - 4x = 3x + 6$ ;       $\mathbf{x} =$

- A)  $\frac{1 \pm \sqrt{73}}{2}$       B)  $-\frac{2}{3} \text{ \& } 3$       C)  $\frac{7 \pm i\sqrt{23}}{6}$       D)  $\frac{2}{3} \text{ \& } 3$

- 4.) Solve the following quadratic equation using the quadratic formula.

**Express your answer in simplest radical form.**  $2x^2 - 4x + 1 = 0$ ;       $\mathbf{x} =$

- A)  $2\sqrt{2}$       B)  $\sqrt{2}$       C)  $\frac{2 \pm \sqrt{6}}{2}$       D)  $\frac{2 \pm \sqrt{2}}{2}$

**For questions #5 – 8 use the following:  $y = x^2 + 4x - 5$**

- 5.) Where does the graph of this function cross the x-axis?  $\mathbf{x} =$

- A) -5      B) -5 & -1      C) -5 & 1      D) 5 & -1

- 6.) Find the equation for the axis of symmetry. **(Use  $y = x^2 + 4x - 5$ )**

- A)  $x = -2$       B)  $x = 2$       C)  $x = -5/2$       D)  $x = 4$

- 7.) Find the coordinates of the vertex. **(Use  $y = x^2 + 4x - 5$ )**

- A) (2, 7)      B) (-2, -9)      C) (4, -5)      D) (4, 27)

$$y = x^2 + 4x - 5$$

- 8.) Is the extreme point (vertex) a maximum or a minimum point? Explain.  
Pick the **ONE** answer below that is completely correct. (Read these carefully.)

The vertex is \_\_\_\_\_

- A) a **maximum** point since the curve is concave-upward.
- B) a **maximum** point since the curve is concave-downward.
- C) a **minimum** point since the curve is concave-downward.
- D) a **minimum** point since the curve is concave-upward.

- 9.) Simplify  $i^{18}$  where  $i = \sqrt{-1}$

- A)  $-i$     B)  $i$     C)  $1$     D)  $-1$

- 10.) Combine:  $(8 - 4i) - (2 - 3i) - (-5 + i)$

- A)  $11 - 2i$     B)  $9i$     C)  $12$     D)  $11 - 8i$

- 11.) **Multiply**  $(4 + 3i)$  by its conjugate and simplify.

- A)  $-4 - 3i$     B)  $7 + 24i$     C)  $7$     D)  $25$

- 12.) Solve the following quadratic equation. Simplify your answer.

$$x^2 - 4x + 5 = 0; \quad x =$$

- A)  $2 \pm 2i\sqrt{2}$     B)  $2 \pm \sqrt{15}$     C)  $2 \pm i$     D)  $-2 \pm 2i$

**Part II: Show all of your work using the methods used in the lectures. To receive credit you must type out your work.**

- 13.) Solve by completing the square. Show all steps. Leave your answer in simplest radical form.  $2x^2 - 12x + 2 = 0$

- 14.) Divide and simplify:  $\frac{3}{2 - 3i}$  (Do not write your answer in decimal form.)

Keep the fractions.)

15.) Solve the following radical equation for x. Remember to show the check.

$$\sqrt{16 - 4x} + 1 = x$$

16.) Reduce the following system of three equations to a system of two equations in two unknowns **by eliminating y**. Show all of your work. **Your answer will be two equations, neither of which contains a y.** Type out your work using the methods used in class (in the lectures). You are not solving for x, y and z.

- a)  $2x + y - 3z = -4$
- b)  $3x - 2y + z = 19$
- c)  $x + 3y + 2z = -5$

17.) Solve the following word problem using two variables and a system of two equations.. You must use an algebraic solution **and show your equations** to receive credit. The cost of 3 hamburgers and 2 sodas is \$14.90. The cost of one hamburger is 30 cents more than the cost of two sodas. Find the cost of one hamburger. (Let x = the cost of one hamburger and y = cost of one soda.)