

MTH 65 – Winter Term 2010  
Test 4 – Given March 8

Name \_\_\_\_\_

<b>You may not use any sort of calculator on this portion of the test.</b>
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1. Solve the equation  $x^2 - 7x - 18 = 0$  using the **zero-product principle**. Make sure that you show steps and organize your work in a manner consistent with that illustrated and discussed in class. (6 points)

2. Solve the equation  $x^2 + 3x - 2 = 0$  using the **quadratic formula**. Make sure that you show steps and organize your work in a manner consistent with that illustrated and discussed in class. Make sure that your solutions are completely simplified. (6 points)

3. Solve the equation  $(2x - 6)^2 = 12$  using the **square-root property**. Make sure that you show steps and organize your work in a manner consistent with that illustrated and discussed in class. Make sure that your solutions are completely simplified. (6 points)

4. Completely simplify each radical expression and write the results in the provide blanks. Do any necessary calculations in the blank space at the bottom of this page. Make sure that all denominators are rationalized and that all fractions are reduced. (2 points each)

a.  $\sqrt{48} =$

\_\_\_\_\_

b.  $-\sqrt{72} =$

\_\_\_\_\_

c.  $\frac{6}{\sqrt{6}} =$

\_\_\_\_\_

d.  $\frac{4}{\sqrt{12}} =$

\_\_\_\_\_

e.  $\frac{3 \pm \sqrt{12}}{6} =$

\_\_\_\_\_

f.  $\frac{-4 \pm \sqrt{32}}{4} =$

\_\_\_\_\_

5. This entire problem is about the parabola with equation  $y = -x^2 + 4x + 5$ .

a. What is the vertex of the parabola? (2 points)

b. Graph the parabola onto Figure 1 after first completing Table 1 with nine ordered pairs centered at the vertex. (6 points)

Table 1: $y = -x^2 + 4x + 5$	
$x$	$y$

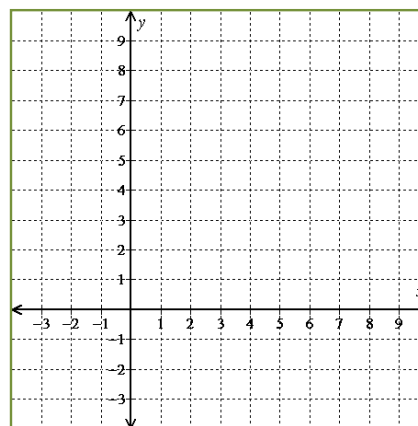


Figure 1:  $y = -x^2 + 4x + 5$

c. Provide each bit of information in the provided blanks. (8 points)

The  $x$ -intercepts of the parabola are: \_\_\_\_\_.

The  $y$ -intercept of the parabola is: \_\_\_\_\_.

The axis of symmetry for the parabola is \_\_\_\_\_.

6. What is the vertex of each of the following parabolas? You may do your work on scratch paper and write your result in the provided blank. (4 points)

a. The vertex of the parabola  $y = 2x^2 + 6x$  is \_\_\_\_\_.

b. The vertex of the parabola  $y = -x^2 + 8$  is \_\_\_\_\_.

7. Find the  $x$ -intercepts of each of the following parabolas. **Show all relevant work!** Make sure that your conclusions are clear. (5 points each)

a. Find the  $x$ -intercepts of the parabola  $y = 2x^2 - 5x - 3$ .

b. Find the  $x$ -intercepts of the parabola  $y = x^2 + 4x + 8$ .

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1. Solve each equation using any method you darn well please. Make sure that you show steps and organize your work in a manner consistent with that illustrated and discussed in class. Make sure that your solutions are completely simplified. This problem continues on page 2.  
(20 points total)

a. Solve the equation  $(x + 4)(x - 1) = 66$ .

b. Solve the equation  $5(x - 4) + 3(x - 2) = 0$ .

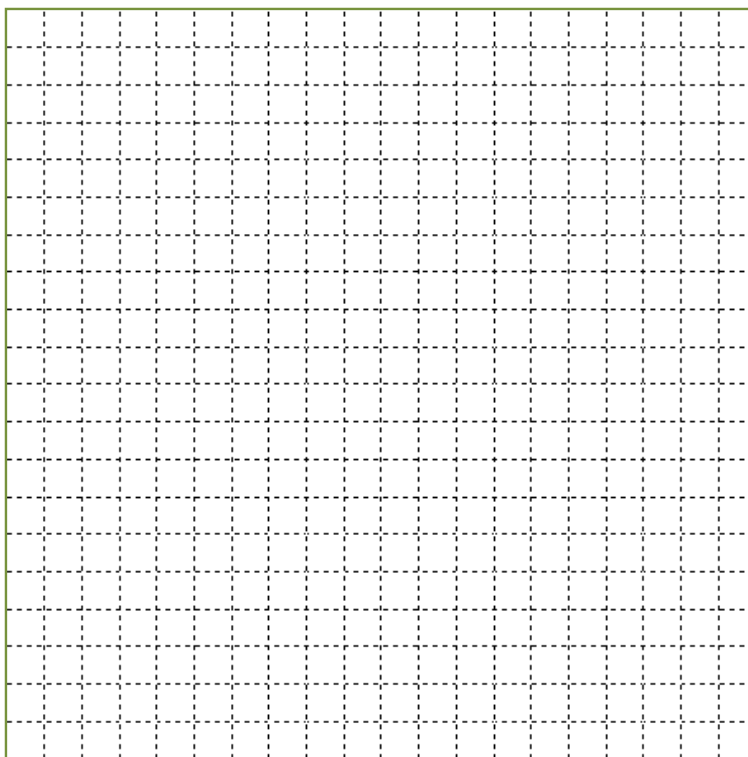
c. Solve the equation  $x^2 = 4x - 20$  .

d. Solve the equation  $(3x + 6)^2 = 54$  .

2. Graph the parabola  $y = 3x^2 + 24x + 51$  onto Figure 1 after first completing Table 1 with nine ordered pairs centered at the vertex. Make sure that you fully label all axes after locating the axes in appropriate locations and choosing appropriate scales for each axis. (10 points)

**Table 1:**  $y = 3x^2 + 24x + 51$

$x$	$y$



**Figure 1:**  $y = 3x^2 + 24x + 51$

3. Polly Wannabe threw her dolly into the air. The height above the ground of Polly's dolly (ft)  $t$  seconds after it was tossed is given by the function  $h(t) = -16t^2 + 64t + 4$ .
- a. What was the maximum height reach by Polly's dolly? Make sure that your reasoning and conclusion are both clear. (4 points)
- b. How many seconds after it was thrown did it take for Polly's dolly to hit the ground? Round your answer to the nearest tenth of a second. Make sure that your reasoning and conclusion are both clear. (6 points)