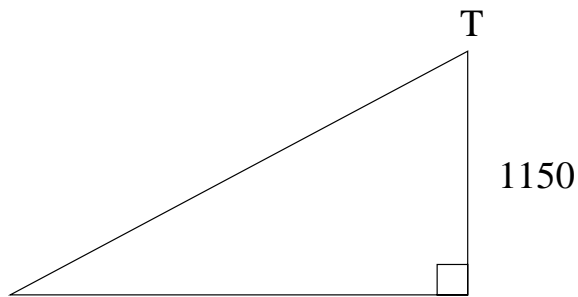


Calculators to be used **ONLY** on this colored-page portion of the test. You may refer to such of your homework as has been graded and returned to you.

When you have finished **BOTH SIDES** of this colored page, put away your calculator and reference materials, then raise your hand to trade this page for the white-pages portion of the test.

Be sure to show your work and circle your answers.

- 1 (MATH 144) If the angle in the figure at **T** is  $62^\circ$ , find two-decimal-place approximations for the lengths of the sides.



- 2 (MATH 144) Solve for all  $\theta$  values in  $[0, \pi]$  such that  $5 \sin(\theta) = 2$ . Use two-decimal radian approximations for your answer.

- 3 (MATH 144) Give a two-decimal-place approximation in degrees for the angle between the  $x$ -axis and the line  $3x + 4y = 6$ .

**MORE** on reverse.

- 4 (MATH 144) Solve the triangle which has one angle of  $110^\circ$  with side opposite  $100 \text{ ft}$  long, and another side of length  $80 \text{ ft}$ .

Make your final results be pictures with sides and angles (in degrees) labeled with two-decimal approximations to their values.

This white-pages part of the test has problems 5 – 11. Take a moment to make sure you have them all.

No Calculators Allowed; No Reference Materials; Just You and Your Pencil and Eraser.

5 Let  $f(x) = 3 - x^2$  and  $g(x) = \frac{x}{x + 4}$ . Expand and simplify each of the following:

(a) 
$$\frac{f(x + h) - f(x - h)}{2h}$$

(b) 
$$g(x - 6) + \frac{1}{g(x + 2)} - g(x^2 - 8)$$

6 (MATH 144) Fill in the table with the exact values of the given clock-face angles:

Hour	$\theta^\circ$	$\theta \text{ rad}$	$\sin(\theta)$	$\cos(\theta)$	$\tan(\theta)$
3 PM					
2 PM					
1:30 PM					
1 PM					
12 noon					
9 AM					
8 AM					
5 PM					

7 (MATH 144) Give diagrams and equations describing **The Law of Cosines**.

8 (MATH 144) Give diagrams and equations describing **The Law of Sines**.

9 (MATH 144) Suppose  $\tan(\theta) = -3$  and  $\cos(\theta) > 0$ , find the exact values of the other five trigonometric functions of  $\theta$ :

(a)  $\sin(\theta) =$  \_\_\_\_\_

(d)  $\csc(\theta) =$  \_\_\_\_\_

(b)  $\cos(\theta) =$  \_\_\_\_\_

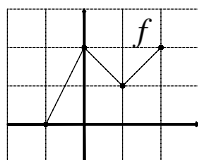
(e)  $\sec(\theta) =$  \_\_\_\_\_

(c)  $\tan(\theta) =$  \_\_\_\_\_

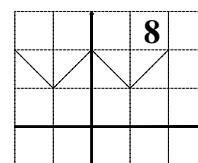
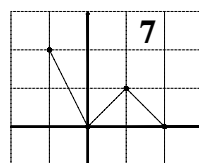
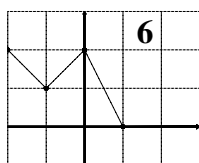
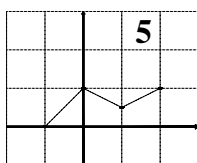
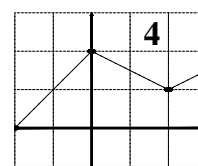
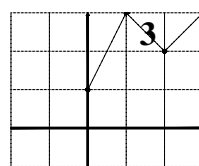
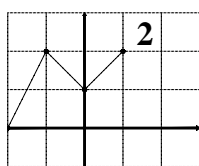
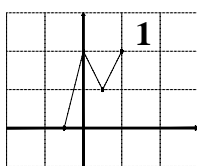
(f)  $\cot(\theta) =$  \_\_\_\_\_

10 Make a rough graph of the polynomial  $P(x) = x^2(x - 3)(x + 3)^2$ .

11 Here is the graph of function  $f$ :



The numbered graphs show transformations of the graph of  $f$ . Fill each blank with the graph number corresponding to the transformed function.



(a) \_\_\_\_\_  $y = f(x/2)$

(e) \_\_\_\_\_  $y = f(2x)$

(b) \_\_\_\_\_  $y = 2 - f(x)$

(f) \_\_\_\_\_  $y = f(x + 1)$

(c) \_\_\_\_\_  $y = 1 + f(x - 1)$

(g) \_\_\_\_\_  $y = f(x)/2$

(d) \_\_\_\_\_  $y = f(|x|)$

(h) \_\_\_\_\_  $y = f(-x)$

MATH 147 030 – Test #1 – 6/22/01 – Name: \_\_\_\_\_7

**MATH 144** students must do problems

- 1
- 2
- 3
- 4
- 6
- 7
- 8
- 9