Trigonometry, MATH 150 NAME _____

Thursday, April 14, 2005 Rec. Instr. _____

Exam 3 Rec. Hour _____

Work as many of the following problems as you can. To assure partial credit, <u>show your work</u>. Calculators <u>are</u> permitted for this exam.

(16 pts) 1. Determine the exact values of the following expressions, or, if the expression is undefined, say so.

a) $\sin\left(\sin^{-1}(-1/2)\right)$

b) $\sin^{-1}(\sin(5\pi/4))$

c) $\tan\left(\tan^{-1}(2000\pi/11)\right)$

d) $\sin\left(\tan^{-1}(3)\right)$

(10 pts) 2. Find an equation for the line through $(4, -1)$ which is perpendicular to the line $2x + 3y = 0$.

(16 pts) 3. How many triangles are there, labelled in the standard way, with:

a) $\alpha = 25°, \quad c = 5, \quad a = 4$

b) $\beta = 38°, \quad a = 5, \quad b = 2$

c) $\gamma = 72°, \quad b = 100, \quad c = 25,000$

d) $\alpha = 25°, \quad b = 100, \quad c = 9$

(10 pts) 4. Given $\alpha = 51.3°$, $b = 23.5$ and $c = 40.0$, find the remaining parts of (all) triangle(s) ABC having such an angle α and such sides b and c.

(18 pts) 5. Two ships leave port at noon; one of them a tugboat sailing steadily at 6 mph, at a bearing of N43°W; and the other a cruise ship sailing steadily at 8 mph, at a bearing of N20°E.

a) At 2 PM, what is the distance between the ships (rounded off to the nearest mile).

b) Again at 2 PM, what is the bearing from the cruise ship to the tugboat?

(10 pts) 6. Find an equation for the parabola wiyh focus at $F(1,1)$ and whose directrix is the line $x = 3$.

(10 pts) 7. Find the focus and directrix of the parabola given by the equation

$$x^2 + 12x - 8y + 44 = 0$$

(10 pts) 8. Find an equation for the ellipse with foci $F(1,2)$ and $F'(1,-4)$, and with minor axis of length 10.