

**DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
SAMPLE MAT 172 FINAL EXAM**

Part I- Each question in this part counts 4 credits.

1. Write an equation of the line perpendicular to the line $y = 3x - 2$ at $(3, 7)$ and sketch its graph.
2. Draw the graph of $y = 5\sin 2x$ from $x = 0$ to $x = 2\pi$.
3. Draw the graph of $f(x) = \frac{2x^2}{x^2 - 4}$. Indicate asymptotes.
4. Draw the graph of $y = 5 - |x - 3|$
5. Draw the graph of $y = 2x^2 - 4x + 7$ and label its minimum.
6. Draw the graph of $y = \sqrt{x - 3}$
7. Write an equation of the line given the graph in Figure 7 on the back of this page.
8. Write an equation of the parabola given its graph in Figure 8 on the back of this page.
9. Let $g(x) = 750e^{.03x}$. Write the inverse of g and specify its domain.
10. Let $F(x) = \log_3 x$ and $H(x) = x^2$. Find the value of $F(H(9))$.
11. Let $f(x) = x^2 - 4$ and let $g(x) = x + 2$. Specify the domain of $f(x)/g(x)$.
12. If $\sin x = 4/5$ and x is an angle in Quadrant II, find the value of $\tan x$.
13. Find the value of $\text{Arcsin}(-1)$
14. In triangle ABC side $a = 10$ in., side $b = 6$ in. and $\angle C = 60^\circ$. Find the length of side c . (Leave your answer in radical form.)
15. State the formula for $\sin(a + b)$ and use it to show $\sin(a + \pi/2) = \cos a$.

Part II- Each question in this part counts 10 credits.

16. If a publisher charges \$50 for a book, she will sell 4000 copies. For each \$5 she raises the price, she sells 100 fewer copies. USE AN EQUATION to determine her maximum revenue.
17. The population of West Oblivion is now 800 people and is known to double every 25 years.
 - a) Write a function that gives the population, $P(t)$, after t years.
 - b) How many years will it take for the population to reach 2400? (A formula will suffice.)

Figure 7

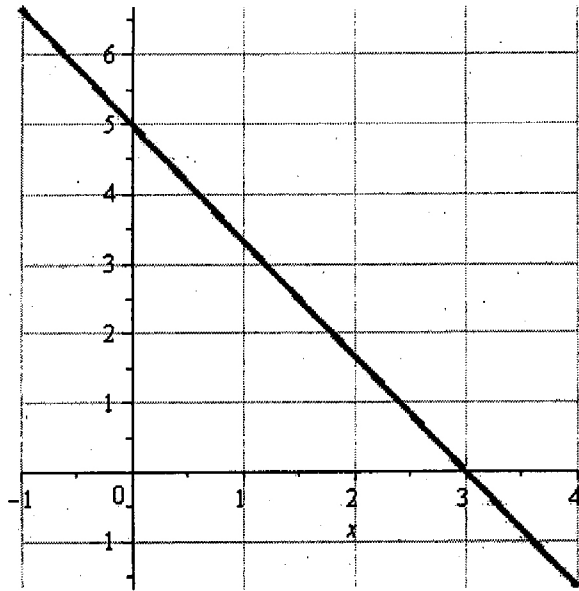


Figure 8

