

Texas A&M University
Mathematics 142
Exam #1
October 2, 1997

Directions: (1) Put all your answers on the printed exam, and put the answers to #1-10 in the answer blanks.

(2) Don't cheat.

(3) GIG 'EM AGS!

Problems 1-10 are worth 3 points each and problems 11-17 are worth 10 points each.

1. _____ What is the slope of the line perpendicular to the line $y = \frac{1}{2}x - 10$?

2. _____ Consider $y = 5x - 7$. If x decreases by 2 then what is the change in y ?

A. decreases by 10; B. increases by 10; C. increases by 14; D. decreases by 14;

E. Cannot determine the answer

3. _____ Suppose that $C(x) = 7 + 5x$ where $C(x)$ is the cost of producing x units of a product. What are the fixed costs?

4. _____ Suppose we are given supply and demand curves $p = 5.2x$ and $p = 10.2 - 4.1x$. Which one is the demand curve?

A. $p = 5.2x$ B. $p = 10.2 - 4.1x$

5. _____ In #4, what is the equilibrium quantity x ? (Give 3 places after the decimal point.)

6. _____ Find the value of x such that $x^3 - 4.1x^2 - 5x - 7 = 0$. (Again, give to three decimal places.)

7. _____ Suppose f is a function whose domain is the set of all real numbers and suppose f is zero exactly once, when $x = 5$. For what value of x is the function $f(x - 2)$ equal to zero?

8. _____ $10^{\log 7} = ?$

9. _____ $\log_6 36^{\frac{2}{3}} = ?$

10. _____ If $f(x) = 3^x$ and

$$g(x) = \begin{cases} x + 1, & \text{if } x \geq 0 \\ 0, & \text{if } x < 0 \end{cases}$$

what is $f \circ g(-2)$?

11. Suppose that the demand equation for a product is $p = 10 - 2x$, where p is price, x the quantity produced. Suppose that the fixed costs of producing the product are 5 and variable costs are 1. What should x be in order to maximize profit?

12. Solve for x : $(\frac{1}{9})^x = 27$. Show how to find x without using your calculator.

13. Solve for x : $10^{x-4} = 3$. (You may use the calculator here.)

14. What is the domain of the function $f(x) = \frac{\sqrt{\log x}}{x-2}$?

15. I'm trying to get my parents to give me their 1972 Jeep. It cost \$4000 new, and let's suppose it was worth \$2500 in 1982. Assuming straight line depreciation, how much is the old heap worth in 1997?

16. Suppose that a bank account has a nominal annual rate of 5% compounded quarterly. If the account is worth \$5000 in 5 years, how much was invested originally?

17. Do a quadratic regression on the following data:

x	0	4	5	7
y	8	1	-1	4

(a) Write down the “best fit” quadratic that you obtain from your calculator.

(b) Using this approximation, approximate the value of y if $x = 6$.