

## SHOW ALL WORK ON SEPARATE SHEET

## Chapters 1&amp;2

Given  $f(x) = \sqrt{-3x - 12}$ , find the following:

- $f(-16)$
- domain of  $f(x)$
- Find the equation of the line, **in standard form**, that passes through the points (3,7) and (-6,4).

Given  $f(x) = -(x - 2)^2 + 1$  find the following:

- vertex
- $x$ -intercepts
- $y$ -intercept

Solve the following equations for  $x$ :

- $7^{3-5x} = 7^{3x-13}$
- $\log_{12} x^2 = \log_{12} 9$
- $\log_4 x - \log_4 (3x + 7) = 4$
- $0.2 = e^{-0.25x}$

## Chapter 3

- Your parents decide to start an annuity when you start first grade to help pay for college. If they deposit \$1000 semiannually into an account that earns 2.5% compounded semiannually through your senior year in high school, how much will the **future value** of the annuity be?

$$FV = PMT \frac{\left((1+i)^n - 1\right)}{i}, i = \frac{r}{m}, n = mt$$

- What is the **present value** of an annuity paying \$500 per quarter for 8 years if the money is worth 6% compounded quarterly?

$$PV = PMT \frac{\left(1 - (1+i)^{-n}\right)}{i}, i = \frac{r}{m}, n = mt$$

- A loan of \$ 6,000 was repaid after 18 months. What **amount** (principal and interest) was repaid if a 7% **simple interest** rate was charged?

$$A = P(1 + rt)$$

- If you paid \$40 in **interest** to a loan company for a use of \$2000 for 240 days, what annual interest rate did they charge? (Assume a year is 360 days.)

$$I = Prt$$

15. If an investment company pays 8% **compounded** quarterly, how much should you deposit now to have \$10,000 in 5 years?

$$A = P \left( 1 + \frac{r}{m} \right)^{mt}$$

#### Chapter 4

16. A system of equations with one unique solution is called a(n) \_\_\_\_\_ system.
17. A system of equations with no solution is called a(n) \_\_\_\_\_ system.
18. A system of equations with infinitely many solutions is called a(n) \_\_\_\_\_ system.

**Given matrices  $A$ ,  $B$ , and  $C$ , find the following:**

$$A = \begin{bmatrix} 6 & -5 & -2 \end{bmatrix}, \quad B = \begin{bmatrix} 1 & 5 \\ 9 & -7 \\ -4 & 2 \end{bmatrix}, \quad C = \begin{bmatrix} 2 & -3 \\ -1 & 0 \end{bmatrix}, \quad D = \begin{bmatrix} 8 & 0 \\ -3 & 3 \\ 1 & -7 \end{bmatrix}$$

19.  $B - D$                       20.  $AB$                       21.  $9C$                       22.  $CD$

23. Find the inverse of the following matrix.  $A = \begin{bmatrix} 4 & 8 \\ 1 & 3 \end{bmatrix}$

24. Use the Gauss-Jordan method to solve the system.
- $$\begin{aligned} x_1 - x_2 - 5x_3 &= -2 \\ 2x_1 + 3x_2 + 5x_3 &= 21 \\ 2x_1 + x_2 - x_3 &= 11 \end{aligned}$$

#### Chapter 5

25. Graph:  $2x + 4y \geq 32$   
 $2x + y \geq 14$   
 $x, y \geq 0$
26. Is the system in #25 bounded or unbounded?

27. Find the corner points of the system in #25.

28. Solve the following linear programming problem by graphing.

$$\begin{aligned} \text{Maximize: } & P = 5x_1 + 5x_2 \\ & 5x_1 + 2x_2 \leq 40 \\ \text{Subject to: } & x_1 + 3x_2 \leq 21 \\ & x_1, x_2 \geq 0 \end{aligned}$$

## Chapter 6

29. How many 5 letter codes can be made from the first half of the alphabet if letters cannot repeat?
30. How many ways can 5 players be picked from a team of 20 if order does not matter?

### College Math

### Final Review – Free Response Section

A farmer owns a 100 acre farm and plans to plant at most three crops. The seed for crops A, B and C costs \$24, \$40, \$30 per acre respectively. A maximum of \$3600 can be spent on seed. Crops A, B and C require 1, 2, and 2 workdays respectively, and there are a maximum of 160 workdays available. If the farmer can make a profit of \$140 per acre for crop A, \$200 per acre for crop B, and \$160 per acre for crop C, how many acres of each crop should be planted to maximize profit? What is the maximum profit?

### College Math

### Final Review – Answers

1] 6      2]  $\{x \in \mathbb{R} \mid x \leq -4\}$       3]  $3y - x = 18$       4] (2,1)      5] (3,0) (1,0)

6] (0,-3)      7]  $x = 2$       8]  $x = \pm 3$       9] no solution

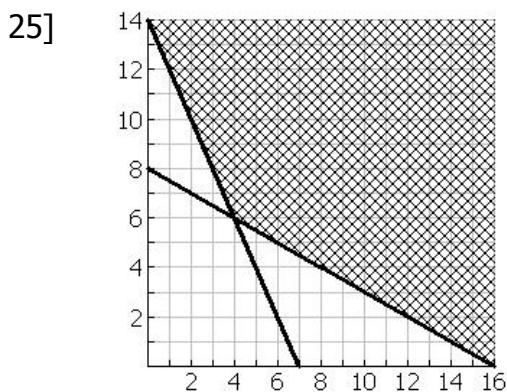
10] 6.4378      11] \$27,788.08      12] \$12,633.57      13] \$6630      14] 3%

15] \$6729.71      16] consistent independent      17] inconsistent

18] consistent dependent

19]  $\begin{bmatrix} -7 & 5 \\ 12 & -10 \\ -5 & 9 \end{bmatrix}$       20]  $[-31 \quad 61]$

21]  $\begin{bmatrix} 18 & -27 \\ -9 & 0 \end{bmatrix}$       22] no solution      23]  $\begin{bmatrix} 0.75 & -2 \\ -0.25 & 1 \end{bmatrix}$       24] infinitely many solutions



26] unbounded

27] (0,14) (16,0) (4,6)

28] maximum of 55 at (6,5)

29] 154,440 codes

30] 15,504 ways

FR] 40 acres of crop A, 60 acres of crop B, 0 acres of crop C; maximum profit of \$17,600