MA 125 Final

1. Find the next two terms in the sequence: 80, 70, 61, 53, 46 …

   a) 103, 91   b) 40, 30   c) 40, 35   d) 34, 21

2. Perfect squares are: 1, 4, 9, 16, 25 … What is the next perfect square?

   a) 36   b) 12   c) 50   d) 81

3. Round 971.837 to the nearest hundred.

   a) 900   b) 1000   c) 971.83   d) 971.84

Use the information below to answer questions 4 and 5.

Let $U = \{2, 4, 6, 8, 10, 12, 14\}$
       $A = \{2, 6, 10, 14\}$
       $B = \{6, 12\}$
       $C = \{4, 10, 12\}$

4. Find $A \cap B$.

   a) {10, 12}   b) {6}   c) {2, 6, 10, 12, 14}   d) { }

5. Find the complement of A.

   a) {4, 8, 12}   b) {4, 10, 12}   c) {6, 12, 14}   d) { }

6. Which set describes the shaded region of the Venn diagram?
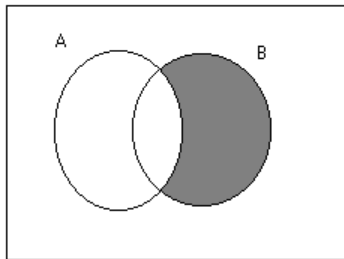
   a) $A - B$ b) $B - A$ c) $A \cup B$ d) $A \cap B$

Use the information below to answer questions 7 and 8

Let m = I am studying mathematics.
p = I have a passing grade.
u = I understand logic.

7. Write in symbolic form "If I understand logic, then I have a passing grade."

   a) $\sim m \wedge u$ b) $u \rightarrow p$ c) $p \rightarrow \sim u$ d) $m \wedge \sim p$

8. Write the following in words: $u \vee \sim m$.

   a) If I understand logic, then I have a passing grade.
   b) I understand logic or I am not studying mathematics.
   c) If I have a passing grade, then I understand logic.
   d) If I do not understand logic, then I do not have a passing grade.

9. Write the negation of "All 2 year olds are bad."

   a) Some 2 year olds are not bad.   b) All 2 year olds are bad.
   c) Some 2 year olds are bad.   d) No 2 year olds are bad.

10. Write in decimal form: ꝯ ꝯ ꝯ ∩ ∩ | | |

    a) 323   b) 3023   c) 332   d) 3022

11. Write 3205 in Roman numerals.

    a) MMCCCV   b) MMMCCV   c) CCCLLV   d) MMMLLV

12. Write MMCCVII in decimal form.

    a) 227   b) 2207   c) 2027   d) 2252

13. Write as a percent: $\dfrac{4}{5}$

    a) 0.08%   b) 0.8%   c) 8%   d) 80%

14. A shoe sells for $60 and costs the store $45. Find the percent of profit on the cost.

    a) 2.5%   b) 25%   c) 33.3%   d) 3.33%

15. Find the LCM of 84 and 180.

    a) 120   b) 1800   c) 180   d) 1260

16. Find the reciprocal of: $-3\dfrac{1}{3}$

    a) $-3\dfrac{1}{3}$ b) $-\dfrac{3}{10}$ c) $3\dfrac{1}{3}$ d) $\dfrac{3}{10}$

17. Solve: $2x - 7 = 3x + 1$

    a) $x = -7$ b) $x = 7$ c) $x = 8$ d) $x = -8$
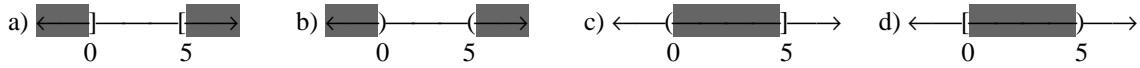
18. Solve by factoring: $x^2 - 7x + 12 = 0$

    a) $-2, -6$ b) $2, 6$ c) $-3, -4$ d) $3, 4$

19. Graph the solution set to $x - 4 < 1$ and $x \geq 0$.

a)   b)   c)   d)

20. $f(x) = x^2 + x - 1$. Find $f(3)$.

    a) -7 b) 0 c) 7 d) 11
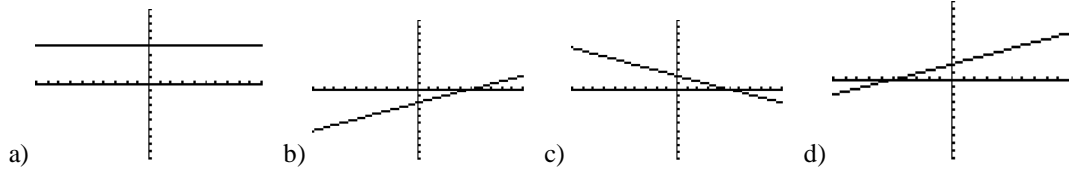
21. Graph the equation: $-2x + 5y = 10$

a)   b)   c)   d)

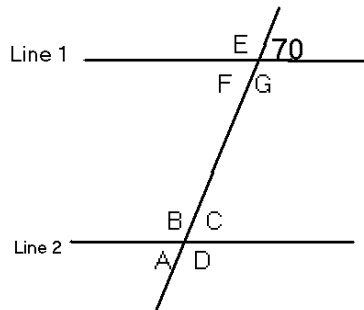22. Find the slope of the line passing the points $(2, 5)$ and $(7, -3)$.

    a) $-\dfrac{5}{8}$ b) $\dfrac{5}{8}$ c) $\dfrac{8}{5}$ d) $-\dfrac{8}{5}$

23. In the figure below, Line$_1$ and Line$_2$ are parallel lines. Find the measure of angle A.

    a) 180° b) 150° c) 110° d) 70°

3

24. Triangles *ABC* and *PQR* are similar with m$\angle A$ = m$\angle P$ and m$\angle B$ = m$\angle Q$. If *AB*, *BC*, and *AC* are 3, 4, and 5 ft long respectively and *QR* is 6 ft, find *PR*.

   a) 4.5 ft   b) 6 ft   c) 7.5 ft   d) 9 ft

25. A rectangular window is framed with 40 ft of ribbon. If the length of the window is 2 ft more than the width, find the dimensions of the window.

   a) 15 ft by 17 ft   b) 14 ft by 16 ft   c) 7 ft by 9 ft   d) 9 ft by 11 ft

Use matrices *A*, *B*, and *C* to answer questions 26, 27, 28: $A = \begin{bmatrix} 3 & x \\ 4 & y \end{bmatrix}$, $B = \begin{bmatrix} 2 & -3 \\ 0 & 1 \end{bmatrix}$, $C = \begin{bmatrix} 5 & -2 \\ 4 & 0 \end{bmatrix}$

26. Find *x* and *y* such that *A* + *B* = *C*.

   a) $x = -1, y = 1$ b) $x = -1, y = -1$ c) $x = 1, y = 1$ d) $x = 1, y = -1$

27. Find 2*B* + *C*.

   a) $\begin{bmatrix} 9 & -8 \\ 4 & 2 \end{bmatrix}$ b) $\begin{bmatrix} 9 & 8 \\ -4 & 2 \end{bmatrix}$ c) $\begin{bmatrix} 9 & -8 \\ 2 & 4 \end{bmatrix}$ d) $\begin{bmatrix} -8 & 9 \\ 4 & 2 \end{bmatrix}$

28. Find 2*C* − 3*B*.

   a) $\begin{bmatrix} 4 & -5 \\ 8 & -3 \end{bmatrix}$ b) $\begin{bmatrix} 4 & 5 \\ 8 & -3 \end{bmatrix}$ c) $\begin{bmatrix} 4 & 13 \\ 8 & 3 \end{bmatrix}$ d) $\begin{bmatrix} 4 & -13 \\ 8 & -3 \end{bmatrix}$

29. Three coins are tossed. How many different outcomes are possible?

   a) 8   b) 6   c) 18   d) 144

30. There are 4 roads going from city A to city B, and 7 roads going from city B to city C. How many routes are there from city A to city C?

   a) 28   b) 56   c) 11   d) 24

31. Find P(6, 2).

   a) 30   b) 20   c) 120   d) 15

32. . A spinner has 3 equal sectors: red, gold, and blue. In 100 spins we get 48 red, 30 gold, and 22 blue. Find the probability of getting blue.

   a) 0   b) $\dfrac{11}{50}$ c) $\dfrac{1}{2}$ d) $\dfrac{3}{10}$

33. Two cards are drawn at random in succession, without replacement, from a standard deck of 52. Find the probability that both cards are black.

a) $\dfrac{26}{52} + \dfrac{25}{51}$ b) $\dfrac{26}{52} \times \dfrac{25}{51}$ c) $\dfrac{26}{52} \times \dfrac{26}{52}$ d) $\dfrac{26}{52} + \dfrac{26}{52}$

34. A spinner has 4 unequal sectors: $\dfrac{3}{8}$ red, $\dfrac{1}{4}$ blue, $\dfrac{1}{4}$ green, and $\dfrac{1}{8}$ white. If the spinner is spun twice, find the probability that the spinner will lie in the green and then in the red sector.

a) $\dfrac{1}{4}$ b) $\dfrac{5}{8}$ c) $\dfrac{1}{2}$ d) $\dfrac{3}{32}$

35. The following values represent the number of cigarettes persons smoke per day:

5   7   16   12   14   5   17   20   6   15   16   9
17 23   8   19   24 11   7   10

Make a frequency distribution.
What are the corresponding frequencies for the groups 5–8, 9–12, 13–16, 17–20, and 21–24?

a) 6, 3, 4, 4, 3 b) 5, 4, 4, 5, 2 c) 6, 4, 4, 4, 2 d) 6, 4, 3, 5, 2

Use the information below to answer questions 36 and 37.

A teacher finds that the mean score of his class is 84 with a standard deviation of 6. (Use the table in the back of the book, if needed.)

36. Find the z-score corresponding to 96.

a) –3 b) 3 c) 2 d) –2

37. Find the probability that a student will have a score between 84 and 96.

a) 0.96 b) 0.48 c) 0.34 d) 0.68

38. A camera originally priced at $650 is on 30% discount. How much is the discount?

a) $455 b) $195 c) $45.50 d) $19.50

A credit card holder is obligated to pay the balance in full if it is less than $20. Otherwise, the minimum payment is $20 or 6% of the balance, whichever is more. Suppose that a customer received a statement listing the balance as $320.

39. Find the minimum payment due.

a) $200 b) $192 c) $20.00 d) $19.20

40. The finance charge is 1% per month on the unpaid balance. What is the amount of this charge on the next statement if the customer makes only the minimum payment?

a) $3.53   b) $2.25   c) $3.00   d) $1.51