January 25, 1979

Part I

Answer all questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Write your answers in the spaces provided.

1. Solve for $y: 3y - 2 - y = 8$	1
2. Find the value of $ -5 + 5 $.	2
3. Solve for $g: 3g = 2(5 - g)$	3
4. Express the product $(x-5)(x+2)$ as a trinomial.	4
5. What is the product of $2x^3$ and $3x^2$?	5
6. Solve for $x: 0.4x = 2.4$	6
7. A pole which is 8 feet tall casts a shadow 6 feet long. At the same time, the length of the shadow of a tree on level ground is 60 feet. What is the total number of feet in the height of the tree?	7
8. If $\sin x = .5804$, find the measure of angle x to the	
nearcst degree,	8
9. Factor completely: $2x^2 - 32$	9
10. If the replacement set for x is {2, 3, 4, 5}, find the solution set of $x + 2 > 5$.	10
11. Two numbers are in the ratio 1:5 and their sum is 54 Find the smaller number.	11
12 Express as a single fraction in simplest form: 5x + 2 $x + 1$	
$\frac{5x+2}{3} - \frac{x+1}{3}$	12
13. What is the value of the expression $4x + 2$ when $x = 3$?	13
14. Find the average (arithmetic mean) of 76.3, 45.5, and 72.0 to the nearest integer.	14
15. If 25% of a number is 80, find the number.	15
16. Solve for $x: \frac{x+5}{8} = \frac{x-1}{4}$	16
17. Solve for x in terms of a , b , and c : $ax - b = c$	17

18____

19____

18. From $-5x^2 - 2x - 1$ subtract $2x^2 - 4x + 5$

19. Solve the following system of equations for x:

3x - 2y = 12x + y = 4

Directions (20-30): Write in the space provided the numeral preceding the expression that best completes each statement or answers each question.

- 20. What is the greatest common factor of $5x^3 + 10x$? (1) 5 (2) x (3) 5x (4) $10x^5$ 20____
- 21. What is the reciprocal of $\frac{1}{a}$? (1) $-\frac{1}{a}$ (2) $\frac{1}{a^2}$
- (3) —a (4) a 21.___
- 22. If Arlene was y years old in 1965, her age in 1979 will be (1) 14 (2) y + 14 (3) y 14 (4) 14 y 22___
- 23. If set $A = \{0, 2, 4, 6\}$, which is a subset of A? (1) the set of even numbers (2) the set of whole numbers (3) $\{1, 2, 3\}$ (4) $\{2, 4, 6\}$
- 24. The sum of $2\sqrt{18}$ and $\sqrt{50}$ is (1) $10\sqrt{2}$ (2) $11\sqrt{2}$ (3) $2\sqrt{68}$ (4) $3\sqrt{68}$ 24....
- 25. The set $\{3, -3\}$ is the solution set of (1) $x^2 9 = 0$ (2) $(x + 3)^2 = 0$ (3) 3x = -9 (4) 2x = 6 25____
- 26. When $14x^8 35x^2 + 7x$ is divided by 7x, the quotient is (1) $2x^2 5x$ (2) $2x^2 5x + 1$ (3) $2x^3 5x^2 + x$ (4) $2x^2 5x + x$
- 27. The area of a square is represented by $36x^2$. The length of each side of the square is (1) 6x (2) 18x (3) $6x^2$ (4) $9x^2$ 27____
- 28. The hypotenuse of a right triangle is 7 and one leg is 4. The length of the other leg is (1) $\sqrt{11}$ (2) $\sqrt{28}$ (3) $\sqrt{33}$ (4) $\sqrt{65}$ 28....
- 29. If the y-intercept of a line is 4, which may be an equation for the line? (1) y = x 4 (2) $y = \frac{1}{2}x + 4$ (3) 4y = x (4) y = 4x + 3
- 30. If the graph of the equation 2x + 5y = 4 passes through the point with coordinates (a, -2), the value of a is (1) -3 (2) 0 (3) 13% (4) 7

Part II

Answer four questions from this part.

Show all work unless otherwise directed.

31. Solve graphically and check:

$$2y = -5x$$

 $y - x = 7$ [8, 2]

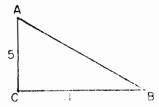
32. Answer both a and b.

a Multiply and express the answer in simplest form:

$$\frac{3x+6}{x^2-7x+10} \cdot \frac{x-5}{2+x}$$
 [5]

b Solve:
$$\frac{2x}{5} - 4 = \frac{2x}{3}$$
 [5]

- 33. A man invested \$3,200 for one year, part at 6%, and the remainder at 7%. If the total income from the investments was \$212, find the amount invested at each rate, [Only on algebraic solution will be accepted.] [5,5]
- 34. Write an equation or a system of equations that can be used to solve each of the following problems. In each case state what the variable or variables represent. [Solution of the equations is not required.]
 - a Joanne and Bill together can paint a fence in 6 hours. If Joanne works alone, it takes her 10 hours. How many hours would it take Bill to paint the fence alone? [5]
 - b The sum of the digits of a two-digit number is 11. The number obtained by reversing the digits is 7 more than twice the original number. Find the original number. [5]
- 35 A square and a rectangle have the same area. The length of the rectangle is 8 more than a side of the square, and the width of the rectangle is 4 less than a side of the square. Find a side of the square. [Only an algebraic solution will be accepted.] [6, 4]
- 36. In right triangle ABC, the right angle is at C. The measure of AC is 5, and the measure of BC is 11.



- a Find to the nearest degree the measure of angle B. [5]
- b Find to the nearest integer the measure of AB. [5]
- 37. On your answer paper write the letters a through e, and next to each letter write the number of the property, chosen from the list below, which is illustrated by the statement. [10]

Properties

- (1) Distributive property of multiplication with respect to addition
- (2) Reflexive property of equality
- (3) Symmetric property of equality
- (4) Transitive property of equality
- (5) Commutative property of addition
- (6) Additive identity property
- a y + 0 = y
- b If x = y and y = 5, then x = 5.
- c 34 + 16 = 16 + 34
- d = 5(6+8) = 30+40
- $e \quad ab = ab$