

## Topics on Algebra I Placement Exam

- Evaluating Expressions
- Applying Order of Operations
- Writing Expressions
- Writing equations and inequalities
- Solving one-step equations and inequalities
- Solving two-step equations and inequalities
- Solving multi-step equations and inequalities
- Plotting points in a coordinate plane
- Graphing linear equations
- Finding slope and rate of change
- Finding equations of horizontal and vertical lines
- Writing equations of lines in slope-intercept form
- Writing equations of parallel and perpendicular lines
- Applications of lines
- Solving absolute value equations and inequalities
- Graphing linear inequalities
- Solving systems by substitution
- Solving systems by linear combination/elimination method
- Solving system word problems
- Determining how many solutions
- Graphing linear inequalities
- Applying properties of exponents, including products, quotients, zero, negative, and power to powers
- Graphing exponential growth functions
- Graphing exponential decay functions
- Using scientific notation
- Application of exponential functions
- Solving quadratic functions by factoring
- Solving quadratic functions by the quadratic formula
- Simplify radicals
- Graphing quadratic functions
- Graphing quadratic inequalities
- Making scatter plots and determining the model that best fits the data
- Adding and subtracting polynomials
- Multiplying polynomials
- Solving polynomial equations
- Factoring trinomials
- Solving proportions
- Simplifying rational expressions
- Multiplying and dividing rational expressions
- Adding and subtracting rational expressions
- Solving rational expressions

# ALGEBRA I PRACTICE FINAL EXAM

Name: \_\_\_\_\_

1. (1.3) Evaluate:  $9 + 9 \cdot 2 - 22 \div 2$

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2. (3.1) Solve:  $-3n + 12 + n = 22$

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3. (3.2) Solve:  $\frac{1}{2}x = -20$

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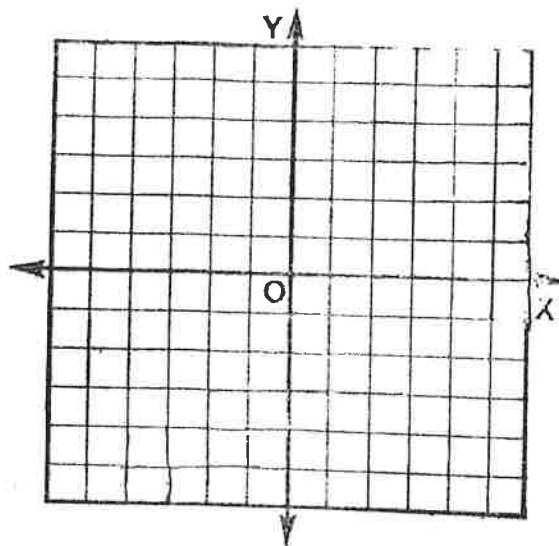
4. (3.4) Solve:  $3 - 4z = -5 + 8z$

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5. (3.4) Solve:  $10(-4 + y) = 2y$

6. (4.2) Complete the table and graph the function:

x	-4	-2	0	2	4
$y = \frac{1}{2}x - 4$					



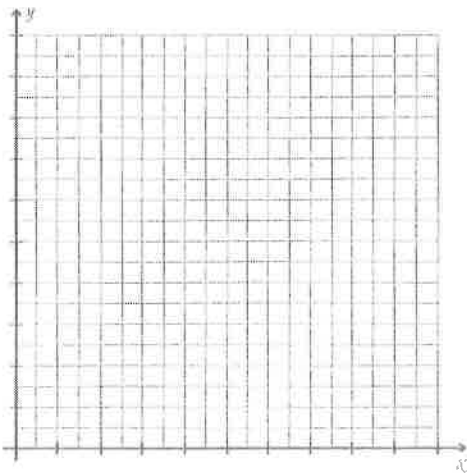
7. (4.2) Write the equation of the horizontal line passing through the point  $(-4, 7)$

8. (4.4) Find the slope of the line passing through the points  $(5, -1)$  and  $(-8, 3)$ .

9. (4.6) Write an equation in slope-intercept form of a line having slope 3 and y-intercept -2.

10. (4.6) Write the equation  $5y - 2x = 3$  in slope-intercept form.

11. (5.1) From 1980 through 1990, Brentwood Middle School's enrollment,  $y$ , was related to the year,  $t$ , by the equation  $y = 240 + 20t$  where  $t = 0$  represents 1980. Sketch the graph of this equation.



12. (5.1) a. The cost of a school banquet is \$70 plus \$15 for each person attending. Determine the linear equation that models this problem.

b. What is the cost for 44 people?

13. (5.2) Write an equation of the line that passes through the point  $(-3, -5)$  and has a slope of  $-2$ . Write the equation in slope-intercept form.

14. (5.3) Write an equation in slope-intercept form of the line that passes through the points  $(-3, -5)$  and  $(1, 9)$ .

15. (6.1) Solve the inequality and graph its solution:  $x - 5 \leq -3$



16. (6.2) Solve the inequality:  $10 - 3x < 5$

17. (6.3) Solve the inequality:

$$3 < x + 1 < 6$$

18. (6.4) Solve:  $|x - 5| = 11$

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19. (6.4) Solve:  $|5 + x| \leq 6$

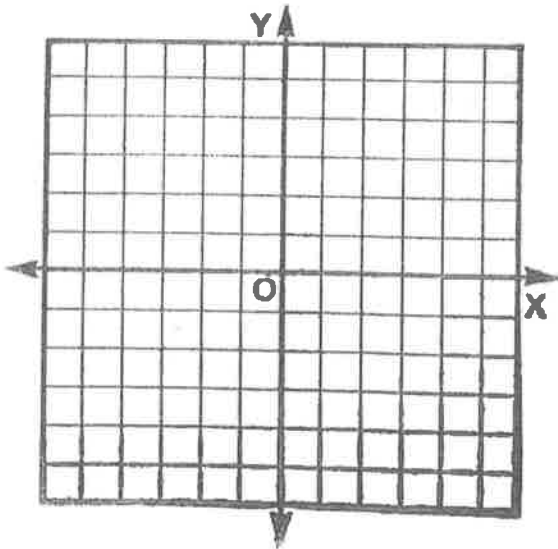
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20. (6.4) Solve:  $|7 - x| > 2$

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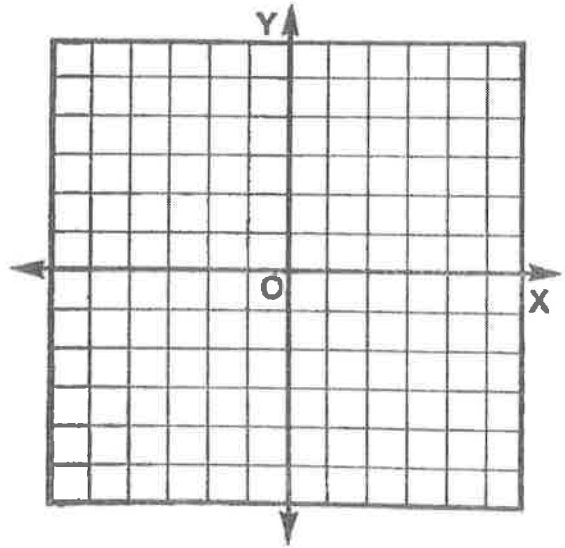
21. (6.5) Graph the inequality:

$$-2x + y > 4$$



22. (7.1) Solve the linear system by graphing.

$$\begin{cases} x + y = 6 \\ x - y = 12 \end{cases}$$



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23. (7.2) Solve the linear system by substitution.

$$\begin{cases} 4x - 3y = -2 \\ 4x + y = 4 \end{cases}$$

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24. (7.3) Solve the linear system by linear combination.

$$\begin{cases} 2x + y = 0 \\ 5x - 4y = 26 \end{cases}$$

25. (7.4) You have 50 tickets to ride the Ferris wheel and the roller coaster. If you ride 12 times, using 3 tickets for each Ferris wheel ride and 5 tickets for each roller coaster ride, how many times did you go on each ride? (Assume you use all the tickets)

26. (7.5) Solve the linear system and tell how many solutions the system has.

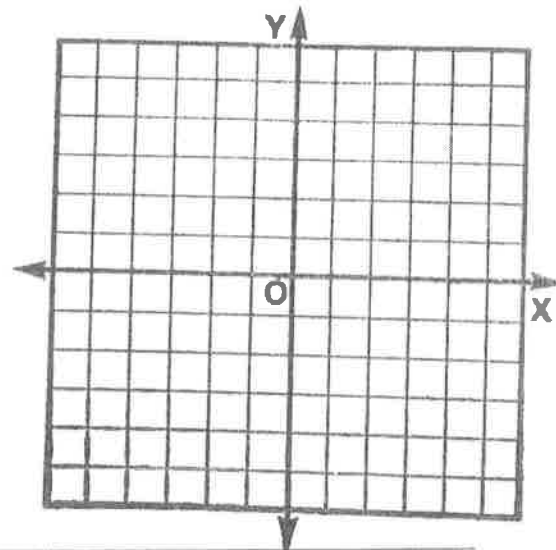
$$\begin{cases} \frac{1}{3}x + y = 2 \\ 2x + 6y = 12 \end{cases}$$

27. (7.5) Solve the linear system and tell how many solutions the system has.

$$\begin{cases} 2x - 3y = 1 \\ -2x + 3y = 1 \end{cases}$$

28. (7.6) Graph the system of linear inequalities:

$$\begin{cases} x < 5 \\ y > -2 \\ x + 2y > 4 \end{cases}$$



29. (8.1) Simplify the expression:

a.  $2^2 \cdot 2^7$

b.  $(4^3)^2$

c.  $(3a)^3 \cdot (2a)^2$

d.  $(w^3x^4y)^2 \cdot (wx^2y^3)^4$

e.  $-(xy^2)^2$

30. (8.2) Evaluate the expression:  $7^{-4} \cdot 7^6$

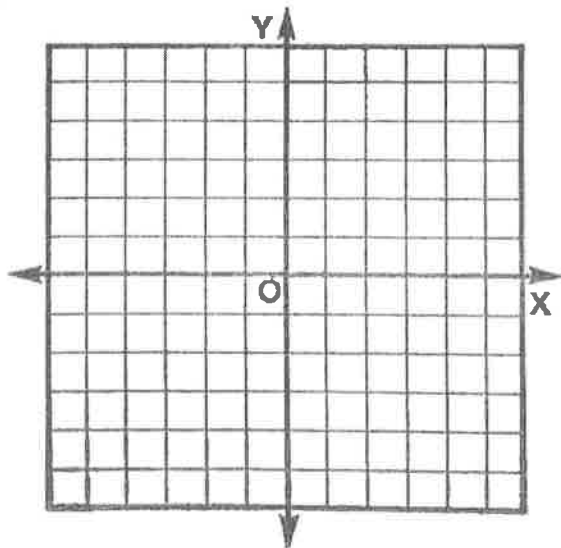
31. (8.2) Rewrite the expression with positive exponents:

a.  $(a^2b)^0$

b.  $\frac{1}{5p^8q^{-3}}$

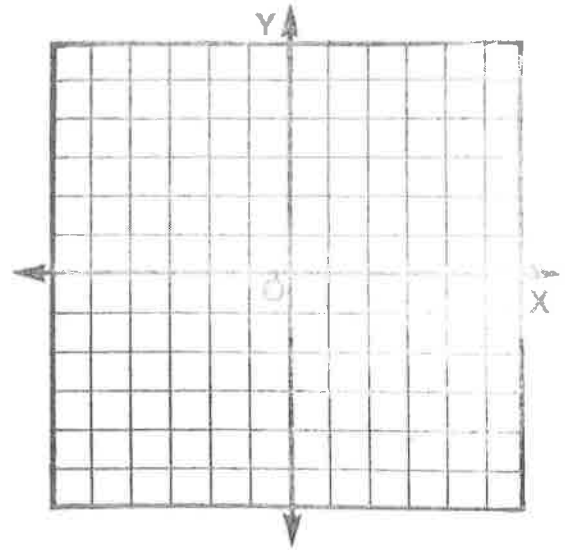
32. (8.2) Complete the table and sketch the graph of the exponential function:

x	-2	-1	0	1	2
$y = 4^x$					



33. (8.2) Complete the table and sketch the graph of the exponential function:

x	-2	-1	0	1	2
$y = \left(\frac{1}{2}\right)^x$					



34. (8.3) Evaluate the expression. Write fractions in simplest form.

a.  $\frac{3^2}{3^5}$

b.  $\left(\frac{m^7}{m^4}\right)^2$

c.  $\frac{32a^4b^{-2}}{2a^3b^3} \cdot \frac{3a^2b^7}{-2a}$

35. (8.4) Rewrite the number in decimal form;  $6.667 \times 10^{-3}$

36. (8.4) Rewrite the number in scientific notation: 523, 000, 000

37. (8.5) You deposit \$500 in an account that pays 8% annual interest compounded yearly. Use the formula:  $y = C(1+r)^t$  to find your account balance after 6 years.

38. (8.6) You buy a used car for \$13,000. The car depreciates at the rate of 12% each year. Use the formula:  $y = C(1-r)^t$  to find the value of the car in 8 years.

39. (9.1) Solve the equation:  $x^2 - 144 = 0$

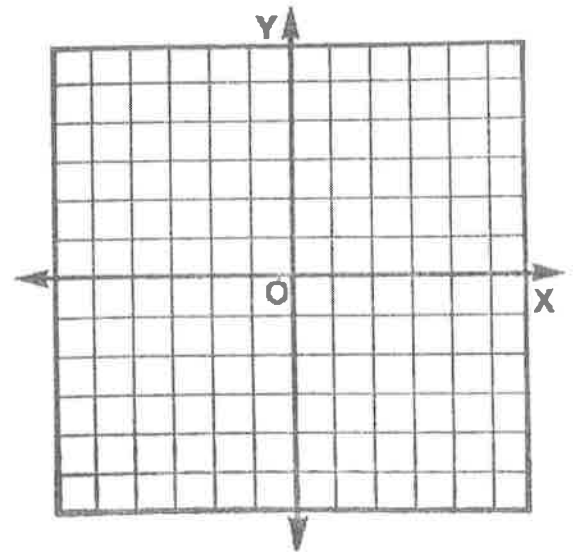
40. (9.2) Simplify the expression:

a.  $\sqrt{45}$

b.  $\sqrt{\frac{36}{64}}$  (Write your answer as a simplified fraction)

41. (9.3) Complete the table and sketch the graph.

x	$y = -x^2 - 3x + 2$
-4	
-3	
-2	
-1	
0	
1	
2	



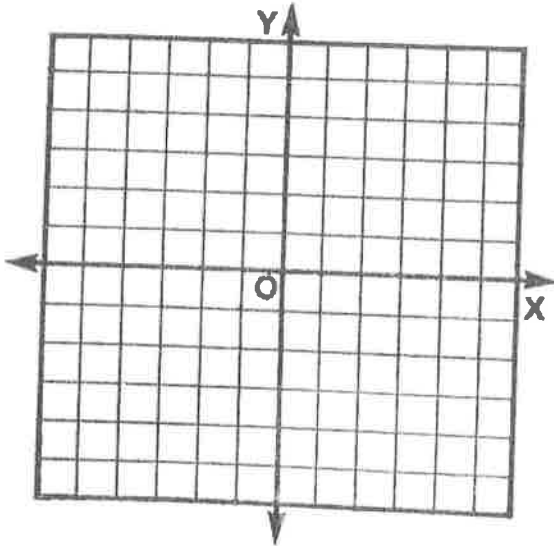
42. (9.5) Use the quadratic formula to solve the equation:  $-2x^2 + x + 6 = 0$

43. (9.6) Tell if the equation has *two solutions*, *one solution*, or *no real solution*.

$$3x^2 - 12x + 12 = 0$$

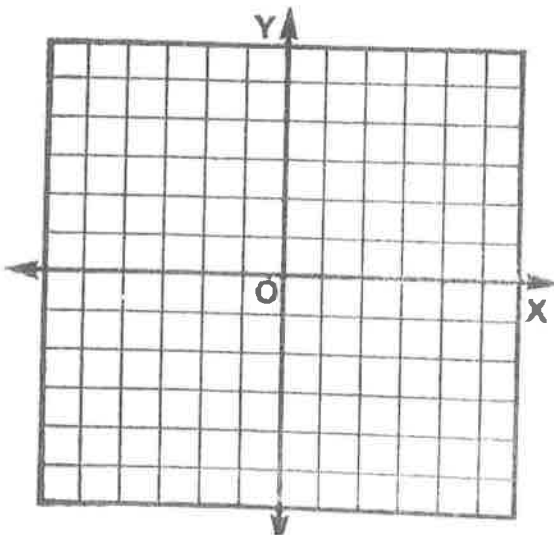
44. (9.7) Complete the table and sketch the graph of the inequality:  $x^2 - 3 \geq y$

x	-3	-2	-1	0	1	2	3
y							



45. (9.8) Make a scatter plot and name the type of model that best fits the data.

$(-3, 4)$ ,  $(-2, 1)$ ,  $(-1, 0)$ ,  $(0, 1)$ ,  $(1, 4)$ ,  $(2, 9)$ ,  $(3, 16)$



46. (10.1) Evaluate:

$$(-x^2 + x + 2) + (3x^2 + 4x + 5)$$

47. (10.1) Evaluate:

$$(x^2 + 3x - 1) - (4x^2 - 5x + 6)$$

48. (10.2) Find the product:

$$(-x)(8x^3 - 12x^2)$$

49. (10.2) Find the product:

$$(7x - 1)(5x + 2)$$

50. (10.3) Find the product:

$$(x + 15)(x - 15)$$



51. (10.3) Find the product:  $(x + 2)^2$

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52. (10.4) Solve the equation:

a.  $(3x + 6)(4x - 1)(x - 4) = 0$

b.  $(x + 9)^2 = 0$

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53. (10.5) Solve the equation by factoring:

$$x^2 + 26x = -169$$

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54. (10.6) Factor the trinomial:

$$12x^2 + 7x + 1$$

55. (10.7) Factor the trinomial:

$$4x^2 + 44x + 121$$

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56. (10.8) Factor the trinomial:

$$2x^2 + 28x + 98$$

57. (11.1) Solve the proportion:

$$\frac{5}{x+6} = \frac{x-6}{x}$$

58. (11.4) Simplify the expression:

$$\frac{7x^3 - 21x}{-14x^2}$$

59. (11.5) Simplify the expression:

$$\frac{x^2 + 3x + 2}{x^2 + 7x + 12} \div \frac{x^2 + 5x + 4}{x^2 + 5x + 6}$$

60. (11.6) Simplify the expression:

$$\frac{6x}{x+4} - \frac{5x-4}{x+4}$$

61. (11.6) Simplify the expression:

$$\frac{2x+1}{8x} - \frac{x}{12x}$$

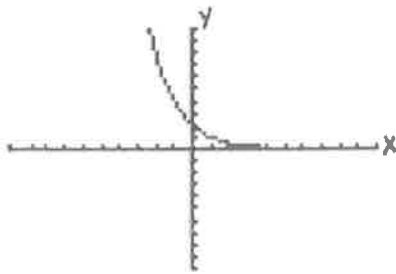
62. Match each of the following graphs to its correct equation. Then, state the type of function each graph represents on the line below the graph. (*constant, linear, quadratic, or exponential*)

A)  $y = -4$

B)  $y = x^2 + 3$

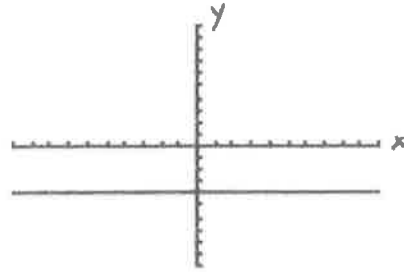
C)  $y = \frac{3}{4}x - 4$

D)  $y = 2(.5)^x$



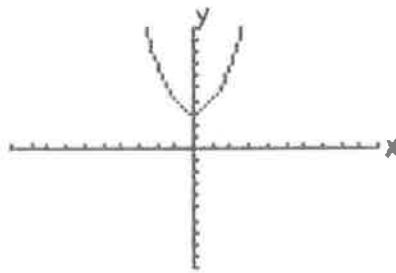
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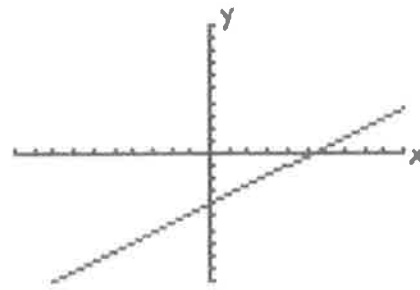
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# ALGEBRA I

## Final Exam Practice Answers

1. 16

2. -5

3. -40

4.  $\frac{2}{3}$

5. 5

6. XXXXXXXXXXXX

7.  $y = 7$

8.  $-\frac{4}{13}$

9.  $y = 3x - 2$

10.  $y = \frac{2}{5}x + \frac{3}{5}$

11. XXXXXXXXXXXX

12.  $C = 70 + 15x$   
\$730

13.  $y = -2x - 11$

14.  $y = \frac{7}{2}x + \frac{11}{2}$

15. XXXXXXXXXXXX

16.  $x > \frac{5}{3}$

17.  $2 < x < 5$

18. 16, -6

19.  $-11 \leq x \leq 1$

20.  $x < 5$  or  $x > 9$

21. XXXXXXXXXXXX

22. XXXXXXXXXXXX

23.  $(\frac{5}{8}, \frac{3}{2})$

24. (2, -4)

25. Ferris: 5

R. Coaster: 7

26. coincident lines  
infinite solutions

27. no solutions

parallel lines

28. XXXXXXXXXXXX

29a.  $2^9$

b. 46

c.  $108a^5$

d.  $W^{10} X^{16} Y^{14}$

e.  $-x^2 y^4$

30.  $7^2$

31a. 1

b.  $\frac{2^3}{5p^3}$

32. XXXXXXXXXXXX

33. XXXXXXXXXXXX

34a.  $\frac{1}{27}$

b.  $m^6$

c.  $-24a^2 b^2$

35. .006667

36.  $5.23 \times 10^8$

37. \$793.44

38. \$4675.25

39.  $\pm 12$

40a.  $3\sqrt{5}$

b.  $\frac{3}{4}$

41. XXXXXXXXXXXX

42.  $-\frac{3}{2}, 2$

43. 1 solution

44. XXXXXXXXXXXX

45. quadratic

46.  $2x^2 + 5x + 7$

47.  $-3x^2 + 8x - 7$

48.  $-8x^4 + 12x^3$

49.  $35x^2 + 9x - 2$

50.  $x^2 - 225$

51.  $x^2 + 4x + 4$

52a. -2,  $\frac{1}{4}$ , 4

52b. -9

53. -13

54.  $(3x+1)(4x+1)$

55.  $(2x+11)^2$

56.  $2(x+7)^2$

57.  $x = -4, 9$

58.  $\frac{x^2-3}{-2x}$

$\frac{4x+3}{2+x}$

61.

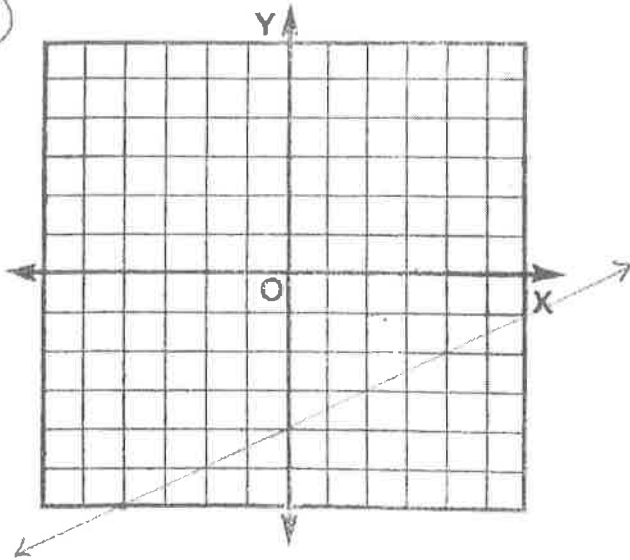
60. 1

$\frac{(x+2)^2}{(x+4)^2}$

59.

6

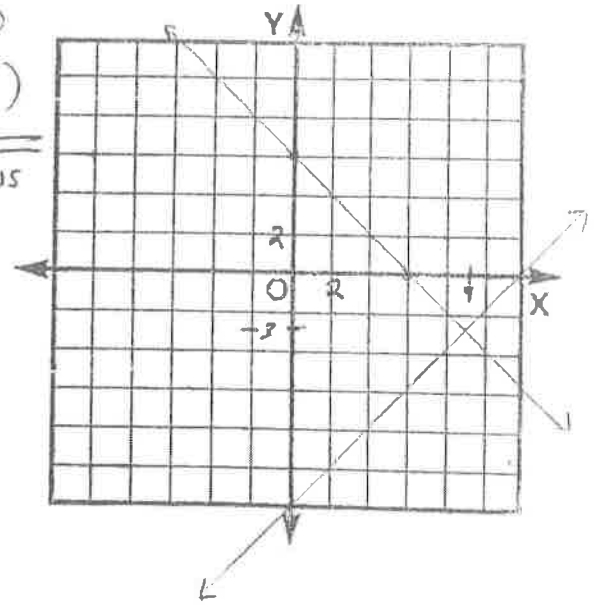
X	Y
-4	-6
-2	-5
0	-4
2	-3
4	-2



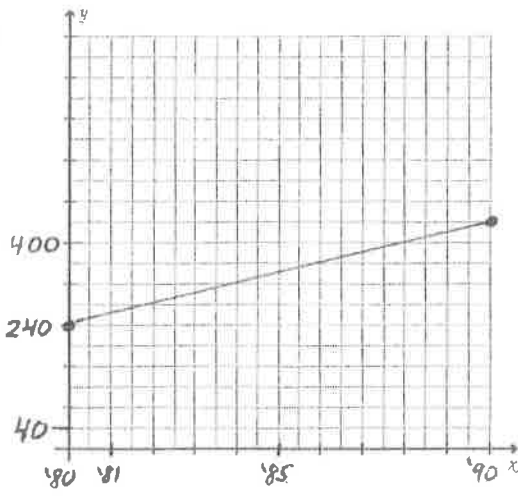
22

(9, -3)

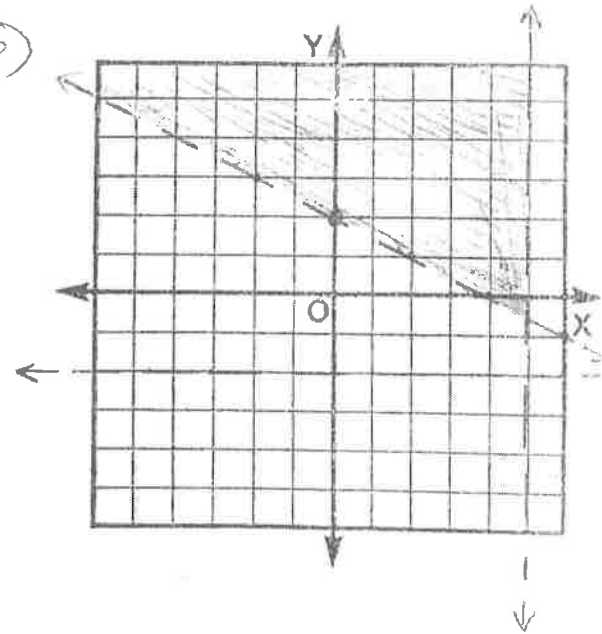
ANS



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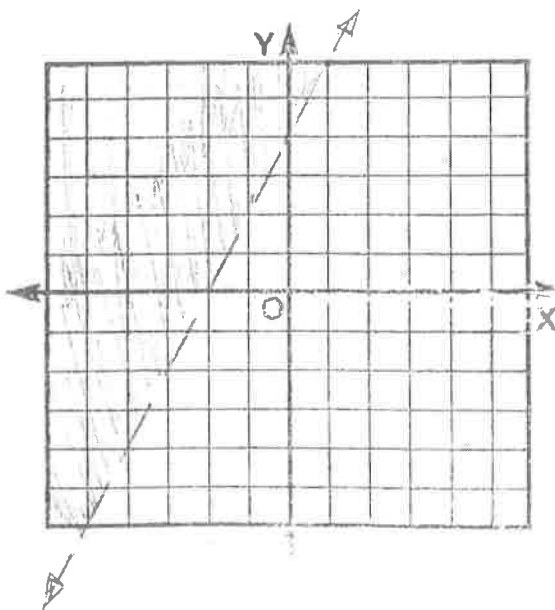
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$x \leq 2$

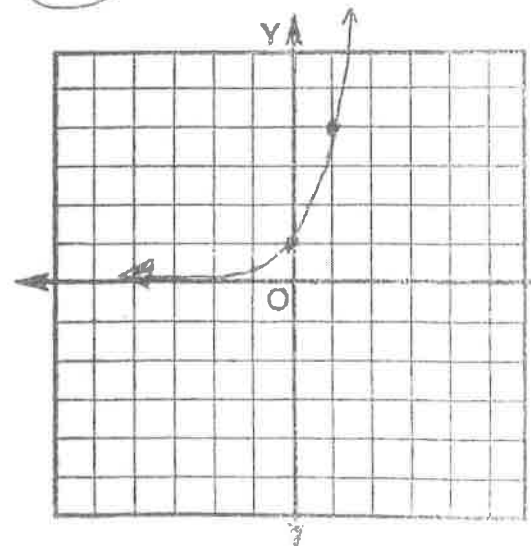


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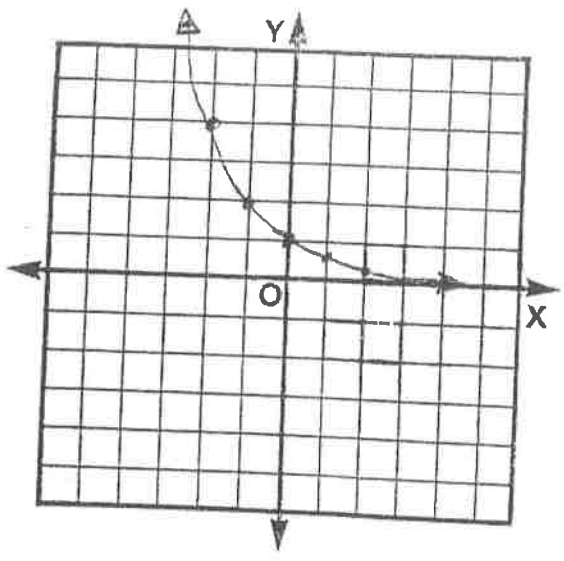


X	Y
-2	1/16
-1	1/4
0	1
1	4
2	16



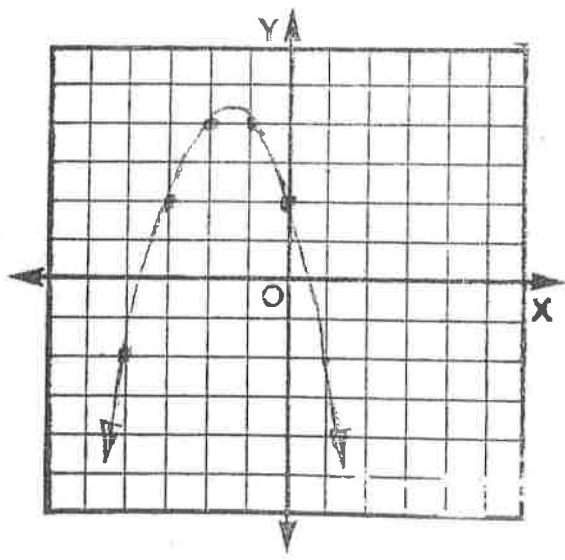
33

X	Y
-2	4
-1	2
0	1
1	1/2
2	1/4

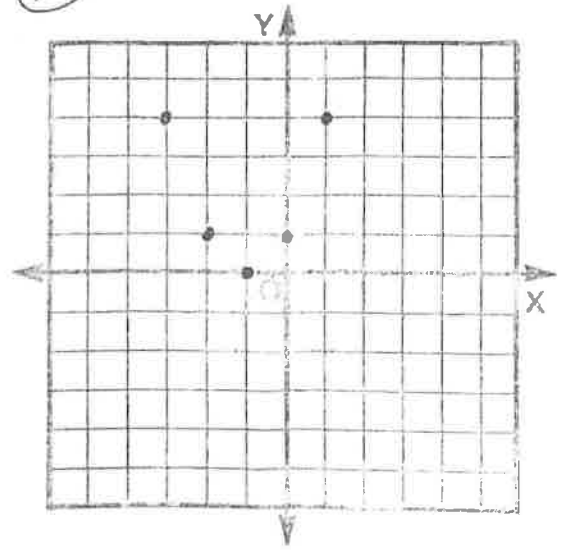


41

X	Y
-4	-2
-3	2
-2	4
-1	4
0	2
1	-2
2	-8

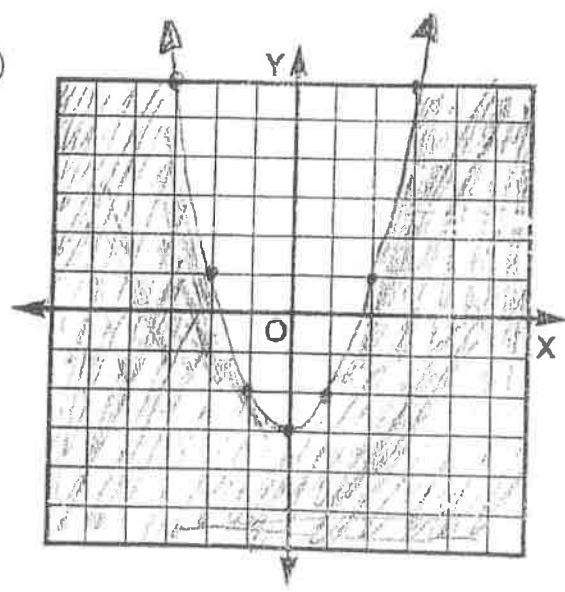


45



44

X	Y
-3	6
-2	1
-1	-2
0	-3
1	-2
2	1
3	6



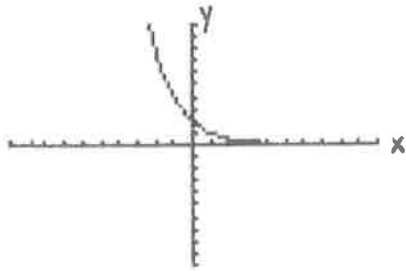
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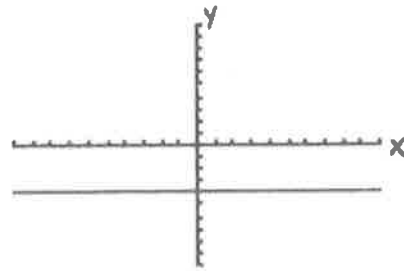
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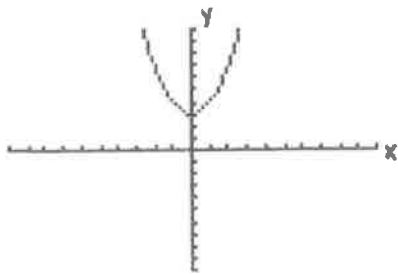
D

exponential



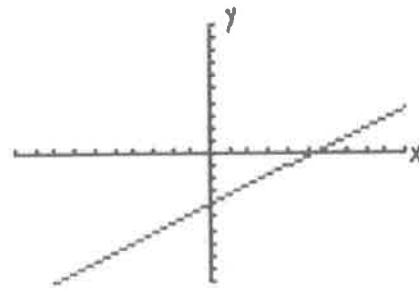
A

constant



B

quadratic



C

linear





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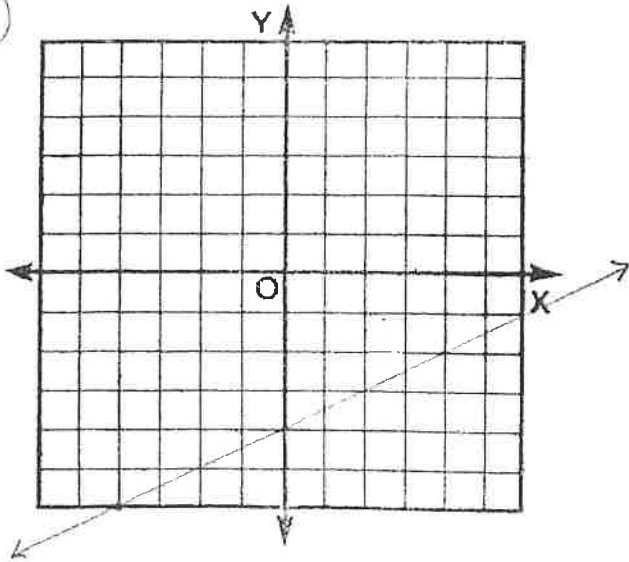
60. 1

61.  $\frac{4x+3}{2+x}$



6

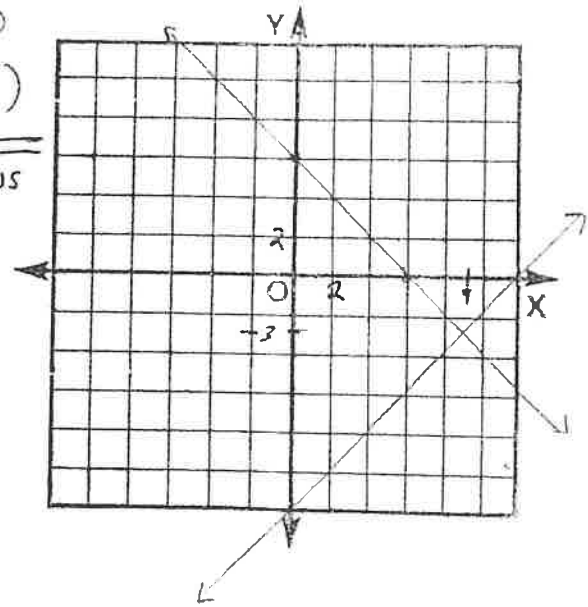
X	Y
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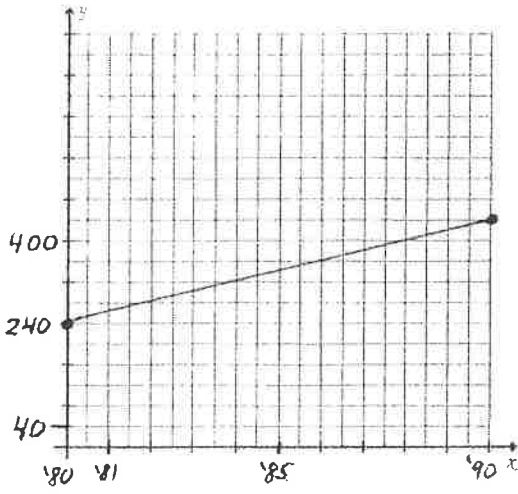
22

(9, -3)

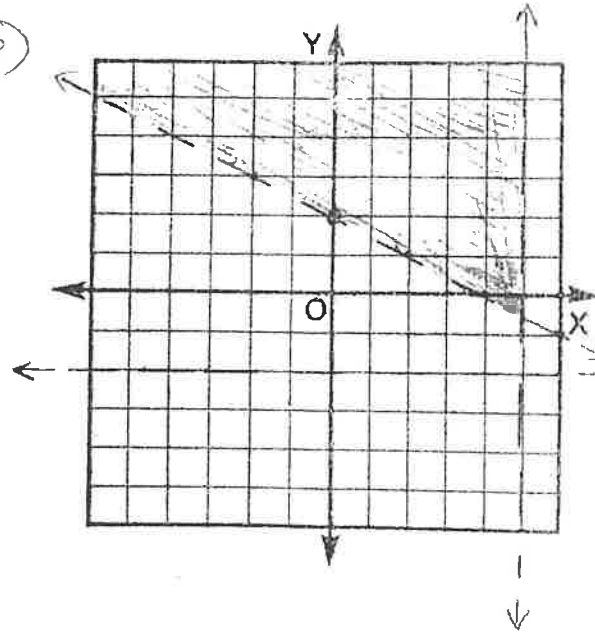
Ans



11



28

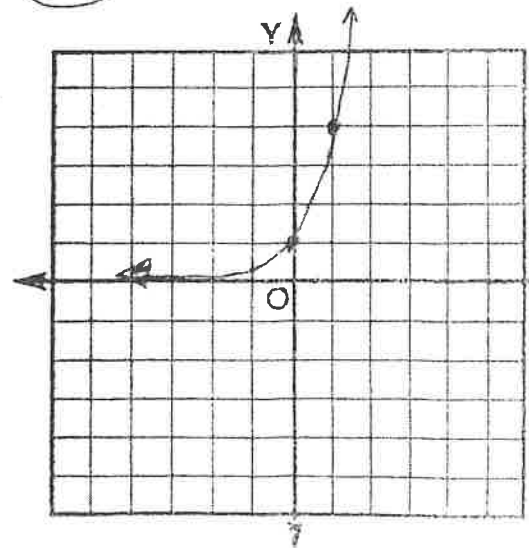


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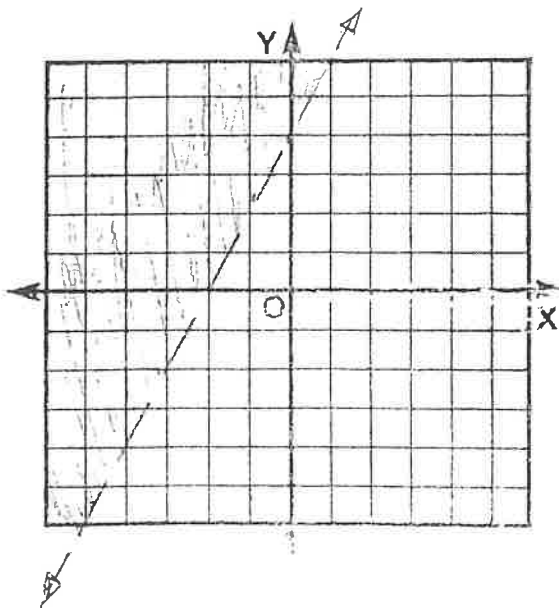


32

X	Y
-2	1/16
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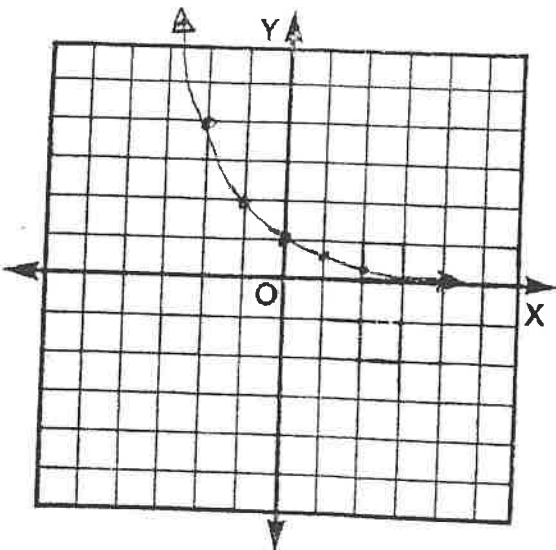
21





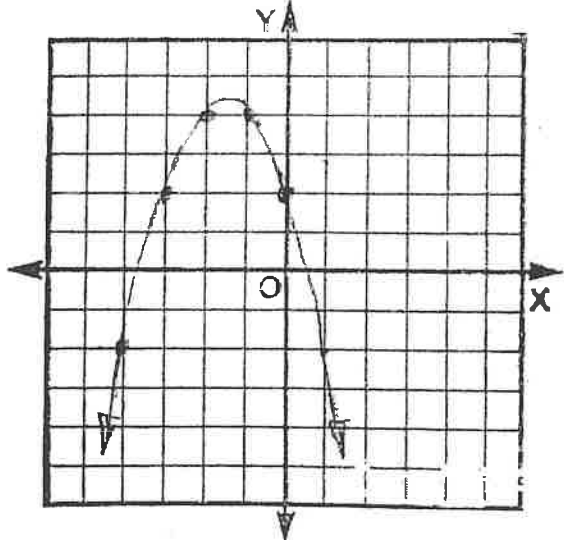
33

X	Y
-2	4
-1	2
0	1
1	1/2
2	1/4

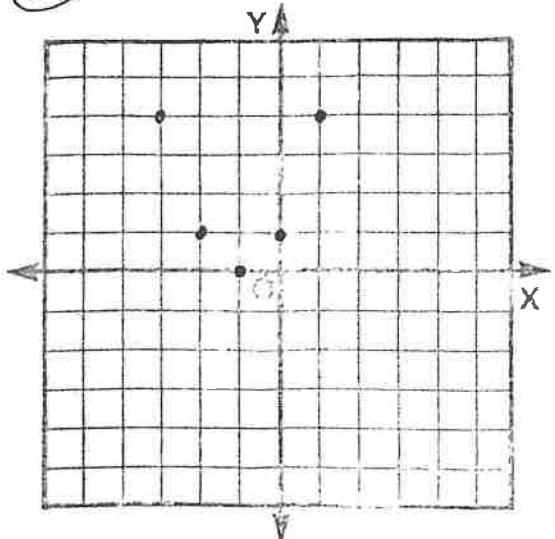


41

X	Y
-4	-2
-3	2
-2	4
-1	4
0	2
1	-2
2	-8

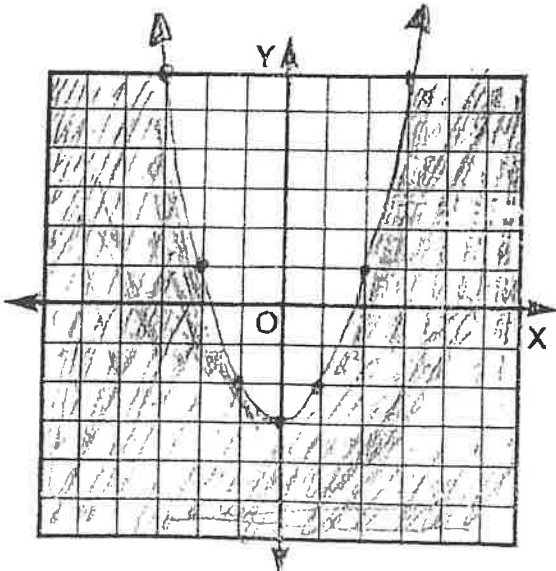


45



44

X	Y
-3	6
-2	1
-1	-2
0	-3
1	-2
2	1
3	6





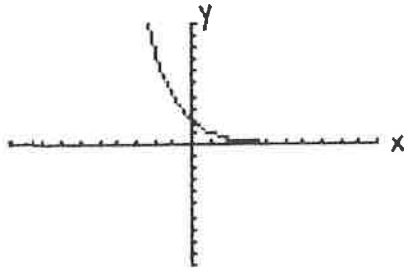
61. Match each of the following graphs to its correct equation. Then, state the type of function each graph represents on the line below the graph. (*constant, linear, quadratic, or exponential*)

A)  $y = -4$

B)  $y = x^2 + 3$

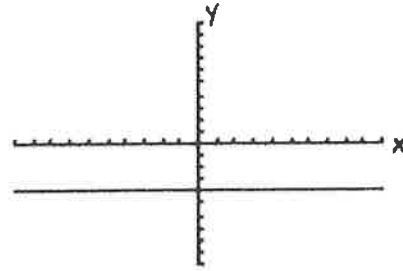
C)  $y = \frac{3}{4}x - 4$

D)  $y = 2(.5)^x$



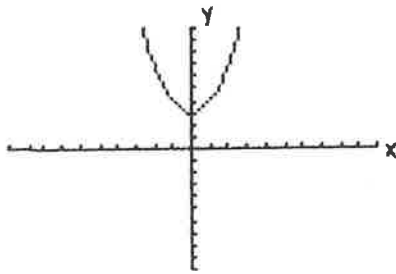
D

exponential



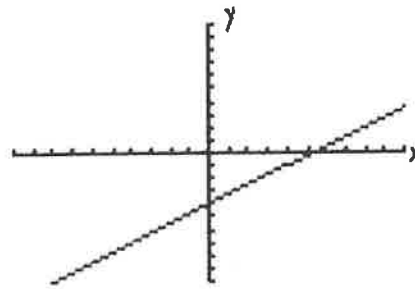
A

constant



B

quadratic



C

linear

