Algebra 2 **Name: _____**

1st Sem. Final Review Ch. 2-6 **Block: _____**

Non-Calculator

2.2 1. Find the slope of the line passing through the points (-5, -4) and (-3, 7).

2. Find the slope-intercept equation of the line passing through the points (-5, -3) and (-2, -6).

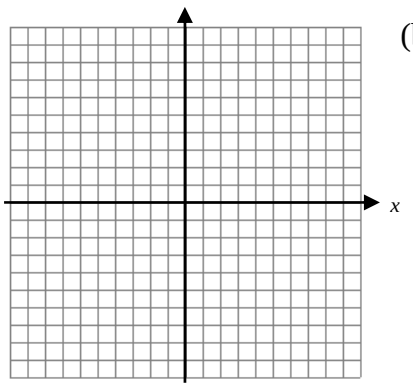
2.3 3. Write a point-slope equation of the line passing through (-1, -8) and (4, -6).

In questions 4 though 8, simplify completely using the properties of exponents. Where applicable, rewrite your answer(s) using only positive exponents.

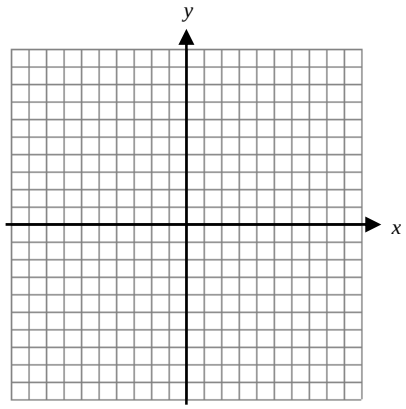
3.2 4. $(7)^{-2}$ 5. $(9)^{\frac{-3}{2}}$ 6. $\dfrac{25^{\frac{3}{4}}}{25^{\frac{1}{4}}}$ 7. $3^{\frac{3}{2}} \cdot 3^{\frac{-7}{2}}$ 8. $\left(100^{\frac{7}{3}}\right)^{\frac{3}{2}}$

3.3 9. Graph each equation. Then identify the domain and range:

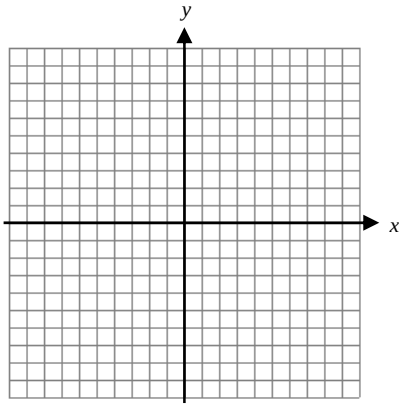
(a) $y = 3^x$



(b) $y = \left(\frac{1}{3}\right)^x$



2.2 10. Graph: $y = \frac{5}{2}x + 3$. Identify the domain and range.



In questions 11 and 12, evaluate.

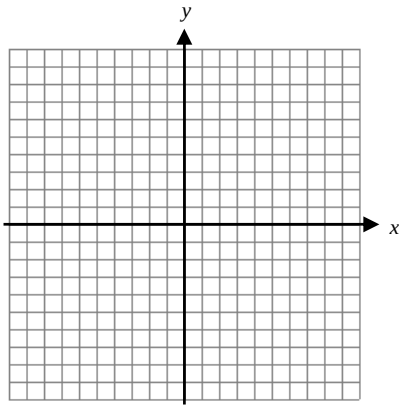
4.2 11. $\log_5 125$ 12. $\ln e^{-5}$

4.2 13. Write the equation $3^4 = 81$ in logarithmic form.

14. Write the equation $\log_{125} 25 = \frac{2}{3}$ in exponential form.

5.2 15. For the equation: $y = -(x+3)^2 - 1$

a) Find the vertex.
b) Write an equation for the line of symmetry.
c) Which way does the graph open?
d) Identify whether the graph has a maximum or minimum value.
e) What is the maximum or minimum value?
f) Graph the function.
g) Identify the domain and range.



5.3 16. Use the function $y = (3x+21)(x-1)$ What are the x-intercepts of the function's graph? What are the coordinates of the graph's vertex?

In questions 40 and 41, write in vertex form.

5.4 17. $y = x^2 + 4x + 1$. 18. $y = 3x^2 - 6x + 1$.

5.5 19. Solve using the quadratic formula: $3x^2 + 7x - 20 = 0$

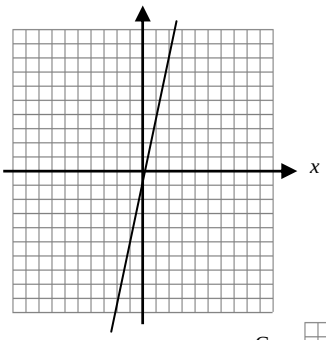
5.5 20. Given: $y = 9x^2 - 12x + 4$
a) Find the value of the discriminant.
b) Determine the number of solutions.

Calculator Allowed

Round any decimal answers to the nearest hundredth.

2.1 21. Identify the graph in which y varies directly as x.

A



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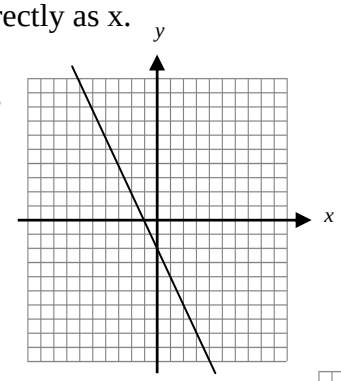

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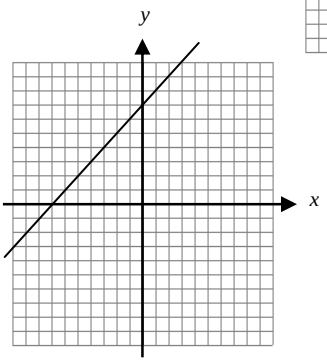

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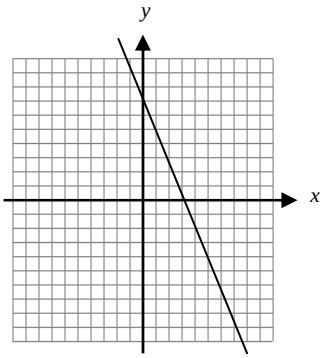


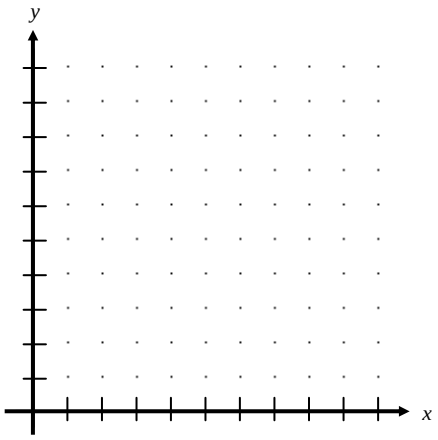
2.1 22. For the equation y = 5x, does y vary directly with x? Answer yes or no.

2.1 23. Find the domain and range of the function f(x) = 8x + 5 for $x \geq 3$.

2.4 24. The table below gives the number of hours a local baseball team spent on batting practice during each week and the number of hits they had in games that weekend.

# of hours	# of hits
0	2
3	4
5	5
7	8
10	10

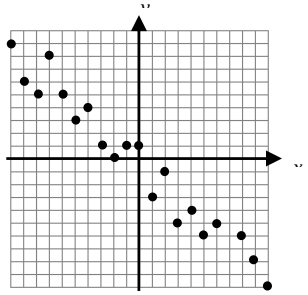
a) Show that the data have a <u>linear</u> relationship by making a scatter plot and drawing a <u>line</u> of best fit. Find an equation of the <u>line</u>.



b) Use your equation to predict the number of hits following a week when 20 hours were spent on batting practice.

2.5 c) What is the correlation coefficient?

2.5 25. What type of relationship (positive, negative, or None) is shown by the scatter plot?



3.3 26. A medication is eliminated from a person's bloodstream at a rate of 10% per hour. Suppose a tablet contains 30 mg of medication. Write an equation for the amount of the medication in the bloodstream after x hours. How many hours will it take for <u>half</u> the tablet to be eliminated?

27. A computer programmer earned a yearly salary of $40,000 in 1990 and averaged a 4% raise each year after that time.

a) Find the doubling time for the programmer's salary.

b) Calculate the programmer's salary in 1998.

3.4 28. If $3900 is deposited in an account at the bank and earns 6% annual interest, compounded continuously, what is the amount in the account after 4 years?

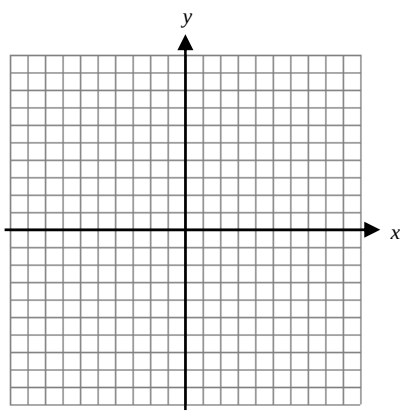
3.5 29. In one state, the Real Estate Board estimates that the median cost of housing will increase <u>exponentially</u> according to the data in this table.

Years since 1990	Median cost (in dollars)
0	77,000
1	79,000
2	83,000
3	90,000
4	99,000

a) Find the exponential regression equation for this data.

b) Estimate the median cost of housing in the year 2005 using your equation for part a.

4.1 30. Graph $y = -2x + 5$ and its inverse in the same coordinate plane. Then, find the equation for the inverse.



4.3 31. Express in terms of logarithms of x, y, and z: $\log_a \frac{4xy^2}{z^5}$

32. Express in terms of logarithms of m, n, and h: $\log_a m^6 nh^3$

In questions 33 and 34, write as a single logarithm.

4.3 33. $7 \log_b x + 5 \log_b y$

34. $4 \log_p 2 - \frac{1}{3} \log_p 64$

4.4 35. Evaluate $\log_5 130$

In questions 36 through 39, solve.

4.4 36. $\log_4 (x+6) - \log_4 x = 2$

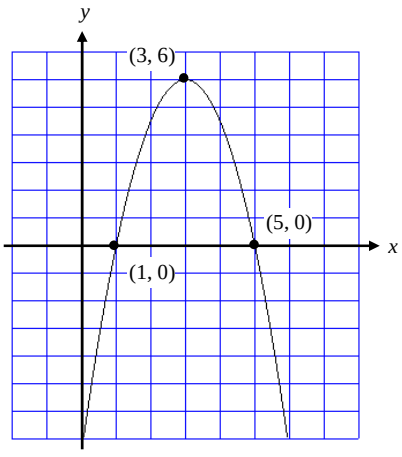
37. $3e^x = 5.7$

5.1 38. $-3x^2 = -36$

39. $2x^2 - 5 = 93$

5.2 40. Write an equation in vertex form for a parabola that has vertex (3, 4) and passes through the point (1, 2).

5.3 41. Write an equation for the parabola shown at right.



5.4 42. The equation $h = -16t^2 + 40t + 5$ gives the height *h*, in feet, of a baseball as a function of time, *t*, in seconds, after it is hit. What is the maximum height the baseball reaches?

5.2 43. Find the maximum value or minimum value for the function: $f(x) = -x^2 + 6x + 4$
5.4

5.6 44. Given: $y = 10x^2 - 17x - 20$. Write the quadratic function as a product of factors.

5.6 45. Solve using factoring: $x^2 + 4x - 5 = 0$

5.5 46. Find the x-intercepts of the graph of $y = x^2 - 13x + 36$.
5.6

6.5. 47. Make a box plot of the data in the table below and identify:

Bushels of Corn Per Acre

Farm A	150.4
Farm B	118.4
Farm C	120.6
Farm D	135.7
Farm E	139.1
Farm F	164.3
Farm G	134.2
Farm H	138.1
Farm I	119.5
Farm J	150.0

a. median
b. mean
c. minimum
d. maximum
e lower quartile(1st)
f. upper quartile(3rd)
g. the range
h. the interquartile range
i. any outliers(if exist)

Box plot:

6.4 48. The daily high temperature readings (in °F) in Kent during the first two weeks of May are given below.

{70, 76, 80, 80, 76, 63, 47, 68, 38, 73, 54, 58, 70, 66}

Complete the table below and make (a) an absolute frequency histogram and (b) a relative frequency histogram for the temperature.

Interval	Tally	Frequency	Relative Frequency
30-39			
40-49			
50-59			
60-69			
70-79			
80-89			

(a) absolute frequency histogram ***(b) relative frequency histogram***

Formulas

Note: ***<u>Only</u> a list of formulas will be given to you on the final. <u>You</u> must apply the correct formula to the correct problem.***

$m = \dfrac{y_2 - y_1}{x_2 - x_1}$ $y = y_1 + a(x - x_1)$ $y = ab^x$

$y = ax + b$ $b^2 - 4ac$ $y = a(x - p)(x - q)$

$y = a(x - h)^2 + k$ $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $A = Pe^{rt}$

$A = P\left(1 + \dfrac{r}{n}\right)^{nt}$ $y = ax^2 + bx + c$ $\dfrac{-b}{2a}$