2023 - 2024 Algebra 2 H Final Review problems!!!!

Name_____ Class_____ Date_____

Do all problems and check answers in the solution section. Do not play "Jeopardy" with the problems. This is a 2 days worksheet. You may work together, but not on Friday. Try your best. Friday's exam comes from this worksheet. See you soon. Love you too.

Add or subtract as indicated. Write the answer in lowest terms.

1) $\frac{x}{x^2 - 16} - \frac{3}{x^2 + 5x + 4}$

2) $\frac{4}{r} + \frac{7}{r - 8}$

Add or subtract as indicated. Write your answer in the form a + bi.

3) $[(6 + 9i) - (4 + 10i)] - (10 - 4i)$

Combine like terms when possible and write the polynomial in descending powers of the variable. Give the degree of the simplified polynomial. Decide whether the simplified polynomial is a monomial, a trinomial, or none of these.

4) $3n^9 - 15n^9 + 4n^7 + 7n^9 - 13n^7$

Evaluate the expression using the given values.

5) $4x - 6y^2$; $x = 3, y = -4$.

6) $\frac{5x + 3}{36 - 2y}$; $x = 3, y = 17$

Evaluate the expression.

7) $5^{-1} + 2^{-1}$

Factor completely. If the polynomial is prime, say so.

8) $16y^4 - 56y^3 - 32y^2$

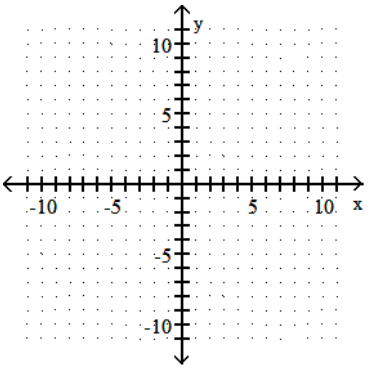
Find the real solutions, if any, of the equation. Use the quadratic formula.

9) $5x^2 + 6x - 8 = 0$

Graph the following by completing the table of values.

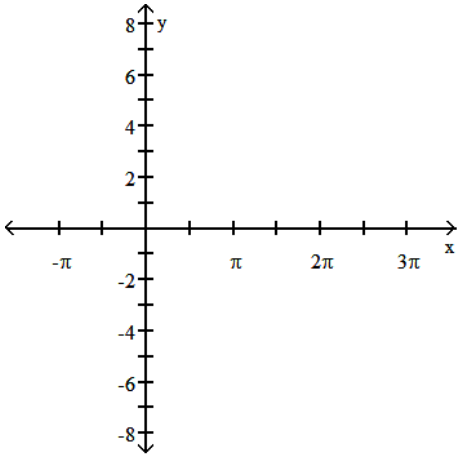
10) $y = 3x^2 + 6$

x	y
-2	
-1	
0	
1	
2	

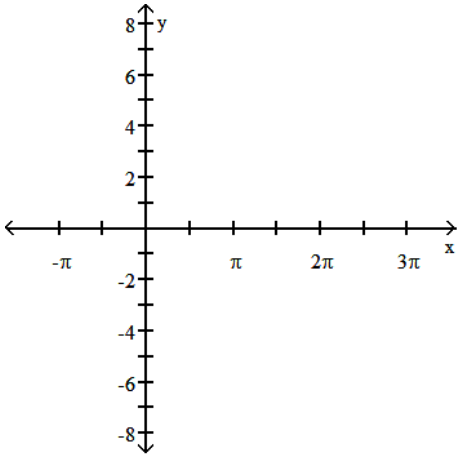


Graph the function. Show at least one period.

11) $y = 3\cos(2x + \frac{\pi}{2})$

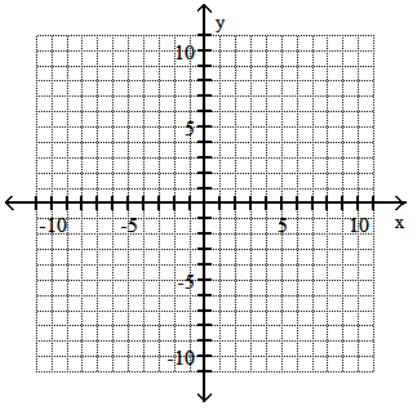


12) $y = -4 \sin(5x + \frac{\pi}{2})$



Graph the linear equation.

13) $y = \frac{1}{2}x + 3$



If the following defines a one-to-one function, find its inverse. If not, write "Not one-to-one."

14) $f(x) = 3x^3 - 7$

15) {(-2, 4), (2, -4), (8, -2), (-8, 2)}

Multiply.

16) (5 - 4i)(2 - 4i)

Perform the division.

17) $\frac{48x^7 + 30x^6 + 12x^4 + 24x^2}{6x^4}$

Perform the indicated operation.

18) $(7x^4 - 4x^2 + x) - (7x^3 + 8x^2 + 9x) + (2x^2 - x)$

Perform the indicated operations. Assume that all variables represent positive numbers.

19) $(\sqrt{6} + 4)(\sqrt{5} + 2)$

Provide an appropriate response.

20) What is the discriminant for $4x^2 - 4x + 1 = 0$? How many and what type of solutions does this equation have?

Simplify the expression. Assume that all variables represent nonnegative real numbers.

21) $2\sqrt{75} - 6\sqrt{108} - 3\sqrt{27}$

Simplify. Write the answer using only positive exponents. Assume all variables represent nonzero numbers.

22) $\frac{(x^{-3})^{-7}(x^{-1}y)^2}{(xy^{-7})^2}$

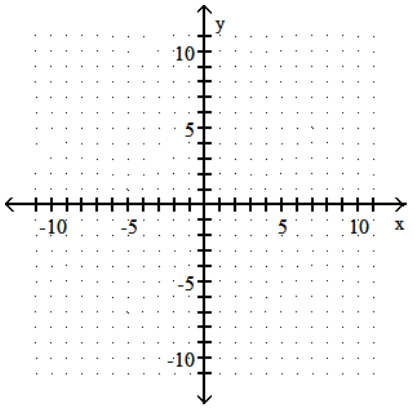
Simplify. Assume that all variables represent positive real numbers.

23) $\sqrt[3]{27a^8b^5}$

24) $\frac{-21}{\sqrt{10} + \sqrt{3}}$

Sketch the graph of the quadratic function. Give the vertex and axis of symmetry.

25) $f(x) = -3(x - 3)^2 + 4$



Solve by the substitution method.

26) $5x - 7y = 26$

$-2x - 2y = 4$

Solve by using the quadratic formula.

27) $8x^2 + 7x = -2$

Solve the equation by completing the square.

28) $x^2 + 8x - 28 = 0$

Solve the equation.

29) $\frac{x}{16} - \frac{3}{8} = \frac{x - 8}{8}$

30) $\log_2 (x - 5) + \log_2 (x - 11) = 4$

31) $4x^2 - 3x - 7 = 0$

32) $81k^2 - 16 = 0$

Solve the equation. Express radicals in simplest form.

33) $4m^2 + 8m + 1 = 0$

Solve the equation. Give the exact solution.

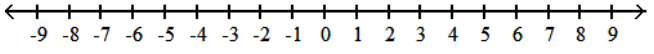
34) $9^x = 81^{(2x + 2)}$

Solve the formula for the specified variable.

35) $F = \frac{9}{5}C + 32$ for C

Solve the inequality and graph the solution set.

36) $-10x + 5(x - 6) \geq 7x - (2 + 2x) - 68$

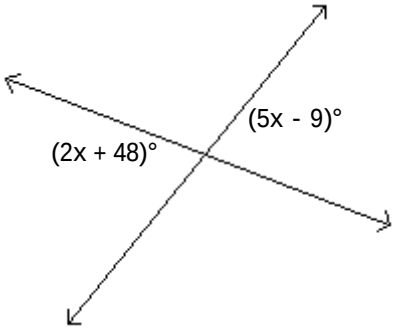


Solve the problem.

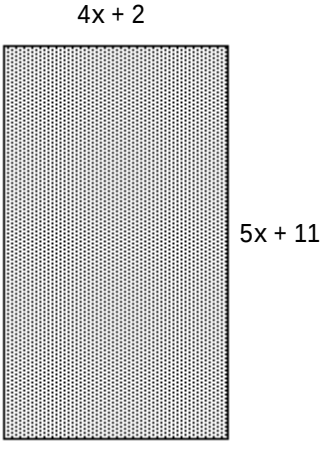
37) A student takes out two loans totaling $13,000 to help pay for college expenses. One loan is at 7% simple interest, and the other is at 8% simple interest. The first-year interest is $950. Find the amount of the loan at 8%.

38) The length of a vegetable garden is 4 feet longer than its width. If the area of the garden is 165 square feet, find its dimensions.

39) Find the measure of each marked angle. Hint: Vertical angles rule



40) For what values of x would the rectangle have a perimeter of at least 170?



41) Suppose $5000 is invested at 4.25% annual interest, compounded continually. (i) What will be the amount in the account in 8 years if no money is withdrawn? (ii) How long will it take for the initial principal to double? Round to the nearest tenth of a year.

42) The windchill temperature was -3° F, and the actual temperature was 28° F. Find the difference between the actual temperature and the windchill temperature.

43) Find the amount of money in an account after 6 years if $1400 is deposited at 8% annual interest compounded quarterly. Assume no money is withdrawn.

44) A building 230 feet tall casts a 100 foot long shadow. If a person looks down from the top of the building, what is the measure of the angle between the end of the shadow and the vertical side of the building (to the nearest degree)? (Assume the person's eyes are level with the top of the building.)

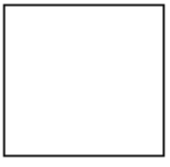
45) Going into the final exam, which will count as three tests, Jerome has test scores of 61, 72, 59, 75, and 77. What score does Jerome need on the final in order to earn a C, which requires an average of 70?

46) A building 150 feet tall casts a 50 foot long shadow. If a person stands at the end of the shadow and looks up to the top of the building, what is the angle of the person's eyes to the top of the building (to the nearest hundredth of a degree)? (Assume the person's eyes are 6 feet above ground level.)

47) The sum of three consecutive even integers is 258. Find the integers.

48) The growth in the population of a certain rodent at a dump site can be modeled by the exponential function $A(t)= 517e^{0.033t}$, where t is the number of years since 1961. Estimate the population in the year 2000.

49) Determine a polynomial that represents the area of the square.



50) The formula for the perimeter of a rectangle is P = 2L + 2W. If P = 52 and W = 10, find the value of L.

51) Andy has 21 coins made up of quarters and half dollars, and their total value is $6.50. How many quarters does he have?

Solve the proportion.

52) $\frac{x + 6}{5} = \frac{x + 8}{7}$

53)

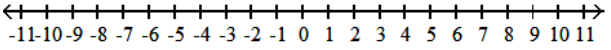
The medium side of a triange is 6 more that 1/2 the shortest side, and the longest side is 4 times the shortest side. If the perimeter is 17 in, find the lengths of the sides of the triangle.

Solve the system by the elimination method.

54) $-6x + 7y = -23$
$-2x - 5y = 29$

Solve, and graph the solution set.

55) $3x^2 + 4x \leq 15$



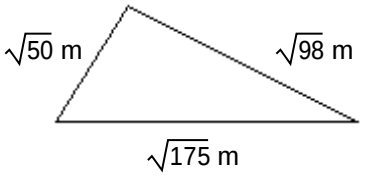
Solve, giving the correct solution to four decimal places.

56) $12^x = 28$

Solve.

57) $x = \sqrt{20x - 20} - 4$

58) Find the perimeter of the triangle. Simplify.



Use long division to find the quotient and the remainder

59) $\frac{p^2 + 5p - 29}{p + 9}$

Use properties of logarithms to write each expression as a single logarithm. Assume that variables represent positive real numbers, with base $\neq 1$.

60) $2\log_a q - \frac{3}{5}\log_a r + \frac{1}{6}\log_a f - 4\log_a p$

Use properties of logarithms to write each expression as a sum or difference of logarithms. Assume that variables represent positive real numbers.

61) $\log_8 xy^2$

Use reference angles to find the exact value of the expression. Do not use a calculator.

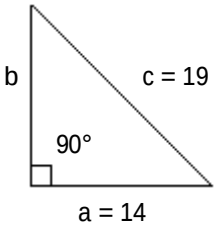
62) $\sin\frac{5\pi}{3}$

Use synthetic division to find the quotient and the remainder.

63) $\frac{x^5 + 9x^4 + 15x^3 - 15x^2 + 16x - 10}{x + 6}$

Use the Pythagorean formula to find the exact length of side b in the figure.

64)



Use any method to solve the equation.

65) $2x^2 - 7x - 9 = 0$

1) $\frac{x^2 - 2x + 12}{(x - 4)(x + 4)(x + 1)}$

2) $\frac{11r - 32}{r(r - 8)}$

3) -8 + 3i

4) $-5n^9 - 9n^7$; 9; binomial

5) -84

6) 9

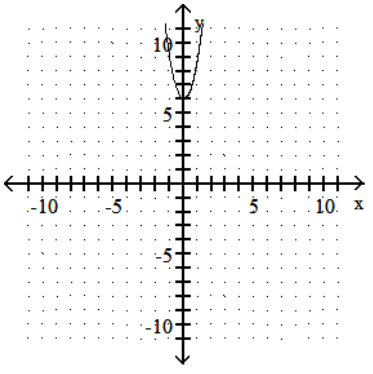
7) $\frac{7}{10}$

8) $8y^2(2y + 1)(y - 4)$

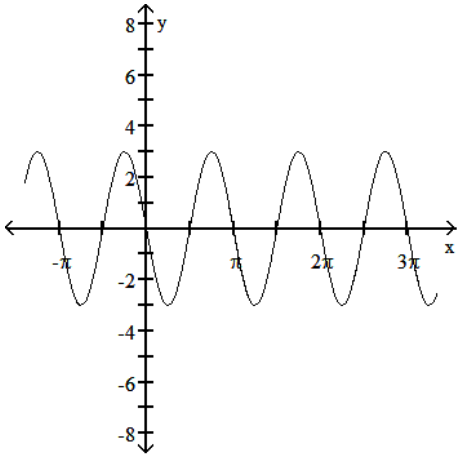
9) $\{\frac{4}{5}, -2\}$

10)

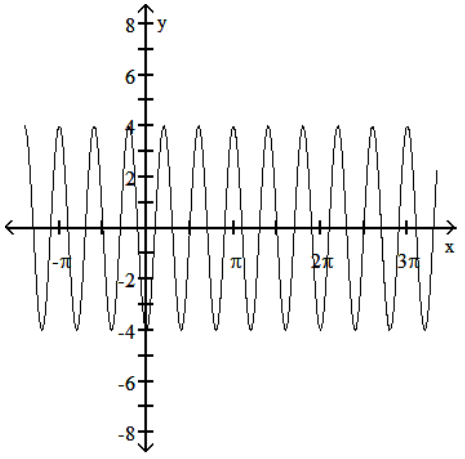
x	y
-2	18
-1	9
0	6
1	9
2	18



11)



12)



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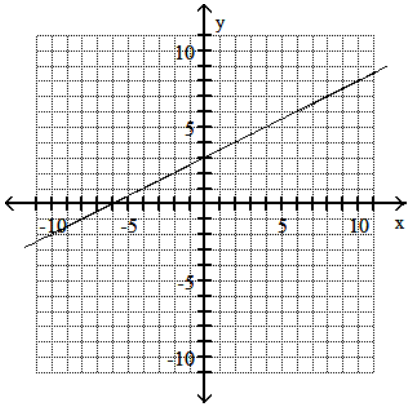


14) $f^{-1}(x) = \sqrt[3]{\frac{x+7}{3}}$

15) {(4, -2), (-4, 2), (-2, 8), (2, -8)}

16) -6 - 28i

17) $8x^3 + 5x^2 + 2 + \frac{4}{x^2}$

18) $7x^4 - 7x^3 - 10x^2 - 9x$

19) $\sqrt{30} + 2\sqrt{6} + 4\sqrt{5} + 8$

20) Discriminant: 0; One rational solution

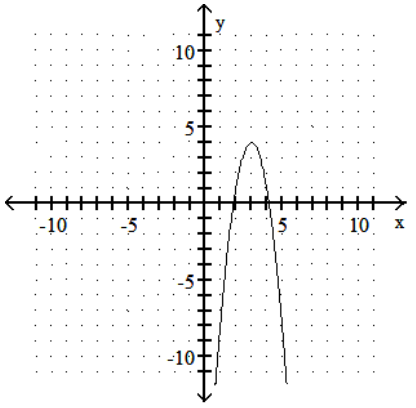
21) $-35\sqrt{3}$

22) $x^{17}y^{16}$

23) $3a^2b\sqrt[3]{a^2b^2}$

24) $-3(\sqrt{10} - \sqrt{3})$

25) vertex (3, 4); axis x = 3



26) {(1, -3)}

27) $\left\{\frac{-7+i\sqrt{15}}{16}, \frac{-7-i\sqrt{15}}{16}\right\}$

28) $\{-4 \pm 2\sqrt{11}\}$

29) {10 }

30) x = 13

31) $\{\frac{7}{4}, -1\}$

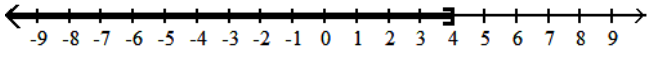
32) $\left\{\frac{4}{9}, -\frac{4}{9}\right\}$

33) $\frac{-2+\sqrt{3}}{2}, \frac{-2-\sqrt{3}}{2}$

34) $-\frac{4}{3}$

35) $C = \frac{5}{9}(F - 32)$

36) $(-\infty, 4]$



37) $4000

38) 11 ft by 15 ft

39) 86° and 86°

40) 8 or greater

41) (i) $7024.74; (ii) 16.3 years

42) 31°

43) $2251.81

44) 23°

45) 72

46) 70.85°

47) 84, 86, 88

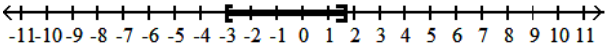
48) 1873

49) $9t^2 + 24t + 16$

50) 16

51) 16 quarters

52) {-1}
53) {-1}
54) {(-2, -5)}
55) $\left[-3, \frac{5}{3}\right]$



56) {1.3410}
57) 6
58) $(12\sqrt{2} + 5\sqrt{7})$ meters
59) quotient: p - 4; remainder: 7
60) $\log_a \frac{q^2 f^{1/6}}{r^{3/5} p^4}$
61) $\log_8 x + 2\log_8 y$
62) $-\frac{\sqrt{3}}{2}$
63) quotient: $x^4 + 3x^3 - 3x^2 + 3x - 2$; remainder: 2
64) $b = \sqrt{165}$
65) $\frac{9}{2}, -1$