Algebta 2 Final Exam Review

Name: _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

If the expression is a polynomial, then state how many terms and variables it contains and state its degree.

1) $3y^3 - 2y^2 - y$ 1) _____

Add as indicated.

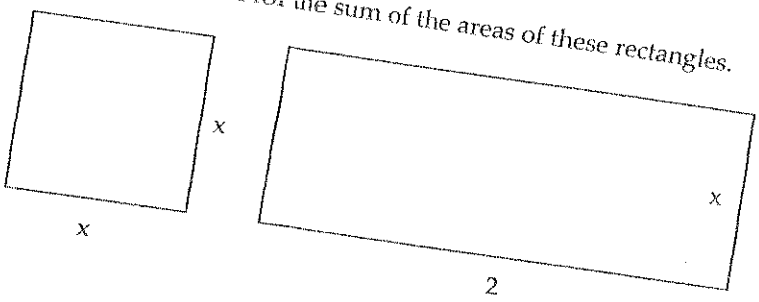
2) $(2x^8 - 4x^4 + 6x^2 + 9) + (3x^7 + 2x^4 - 5x)$ 2) _____

Subtract.

3) $(5x^6 + 9x^8 - 4 - 2x^7) - (5 - 9x^7 + 7x^8 + 3x^6)$ 3) _____

Solve the problem.

4) Find a polynomial for the sum of the areas of these rectangles. 4) _____



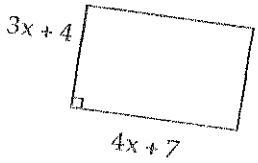
Multiply.

5) $(3x + 5)(3x - 5)$ 5) _____

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

Solve the problem.

7) Determine a polynomial that represents the area of the figure. 7) _____



d the product.

8) $(x + 4y)3$ 8) _____

ynthetic division to perform the division.

9) $\frac{x^5 - 4x^4 - 14x^3 + 14x^2 - 10x - 11}{x - 6}$ 9) _____

0) $\frac{x^4 + 8x^3 + 18x^2 + 17x + 10}{x + 5}$ 10) _____

) into linear factors given that k is a zero of f(x).

$f(x) = 2x^3 - 3x^2 - 5x + 6; k = 1$ 11) _____

Use the factor theorem to decide whether or not the second polynomial is a factor of the first.

12) $7x^4 + 29x^3 - 4x^2 + x + 4;\ x + 4$ 12) _____

13) $8x^3 + 22x^2 - 5x + 3;\ x + 3$ 13) _____

Rewrite using radical notation. Then, simplify if possible.

14) $\left(-32x^{20}\right)^{3/5}$ 14) _____

Simplify. Then write the answer in radical notation.

15) $\dfrac{3^{3/5}}{3^{2/5}}$ 15) _____

Use the rules of exponents to simplify.

16) $\dfrac{7p^{4/5}}{p^{3/5}}$ 16) _____

Multiply.

17) $\sqrt[3]{10xy} \cdot \sqrt[3]{7y}$ 17) _____

Simplify the expression. If any variables exist, assume that they are positive.

18) $-12\sqrt{17} + 7\sqrt{17}$ 18) _____

Multiply and simplify. Assume that all variables represent nonnegative numbers.

19) $2\sqrt{3}\left(\sqrt{11} + \sqrt{3}\right)$ 19) _____

Decide whether or not the functions are inverses of each other.

20) $f(x) = 7x - 7,\ g(x) = \dfrac{1}{7}x + 1$ 20) _____

Find an equation for its inverse.

21) $f(x) = -6x + 1$ 21) _____

22) $f(x) = \sqrt[3]{x + 6}$ 22) _____

For the pair of functions, find the indicated sum, difference, product, or quotient.

23) $f(x) = 8 - 9x,\ g(x) = -2x + 9$
Find $(f + g)(x)$. 23) _____

24) $f(x) = \sqrt{5x + 3},\ g(x) = \sqrt{16x - 25}$
Find $(fg)(x)$. 24) _____

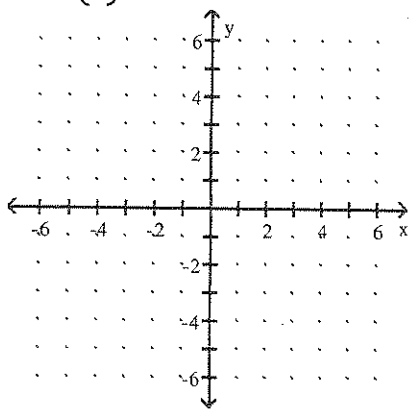
Find the indicated composite for the pair of functions.

25) $f(x) = -6x + 9;\ g(x) = 5x + 9$
Find $(g \circ f)(x)$. 25) _____

26) Given $f(x) = \frac{2}{x - 6}$ and $g(x) = \frac{5}{4x}$, find $(f \circ g)(x)$. 26) _____

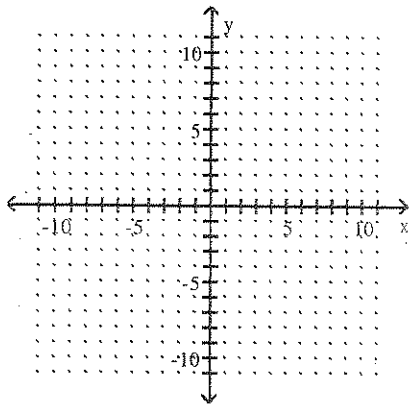
Graph the function.

27) $f(x) = \left(\frac{7}{2}\right)^x$ 27) _____



Graph the exponential function using transformations where appropriate.

28) $f(x) = 4^x - 1$ 28) _____



Solve the equation.

29) $\left(\frac{7}{9}\right)^x = \frac{6561}{2401}$ 29) _____

30) $5^{-x} = \frac{1}{625}$ 30) _____

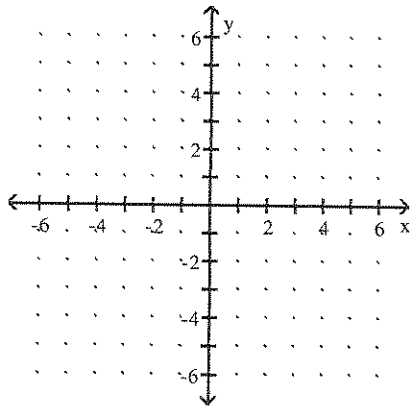
31) $\left(\frac{1}{3}\right)^{5x + 3} = 9^{x - 4}$ 31) _____

32) $e^{x - 1} = \left(\frac{1}{e^5}\right)^{x + 3}$ 32) _____

33) $\log_x 256 = 4$ 33) _____

Graph the function.

34) $f(x) = \log_4 (x - 4)$ 34) _____



Write in logarithmic form.

35) $16^{3/4} = 8$ 35) _____

Write an equivalent expression in exponential form.

36) $\log_{\sqrt{8}} 512 = 6$ 36) _____

Evaluate the logarithm.

37) $\log_{1/8} 8$ 37) _____

Write the expression as a sum, difference, or product of logarithms. Assume that all variables represent positive real numbers.

38) $\log_5 \left(\frac{x^2 y^9}{2}\right)$ 38) _____

39) $\log_a(3x^3y)$ 39) _____

Use the product, quotient, and power rules of logarithms to rewrite the expression as a single logarithm. Assume that all variables represent positive real numbers.

40) $6 \log_a t - \log_a s$ 40) _____

Solve the problem.

41) The growth in the population of a certain rodent at a dump site can be modeled by the exponential function $A(t) = 835e^{0.015t}$, where t is the number of years since 1979. Estimate the population in the year 2000. 41) _____

42) What is the rate on an investment that doubles \$1671 in 5 years? Assume interest is compounded quarterly. 42) _____

43) Find the required annual interest rate, to the nearest tenth of a percent, for \$14,311 to grow to \$16,568 if interest is compounded semiannually for 8 years. 43) _____

Evaluate the expression.

44) 6! 44) _____

45) $\frac{11!}{3!}$ 45) _____

46) ${}_5P_4$ 46) _____

47) ${}_{29}C_1$ 47) _____

Solve the problem.

48) A club has 33 members. In how many ways can they select a person to be President and a different person to be Treasurer? 48) _____

49) There are 12 different books on a table. In how many ways can 6 books be chosen? 49) _____

50) There are 11 members on a board of directors. If they must form a subcommittee of 4 members, how many different subcommittees are possible? 50) _____

51) 8 basketball players are to be selected to play in a special game. The players will be selected from a list of 27 players. If the players are selected randomly, what is the probability that the 8 tallest players will be selected? 51) _____

52) How many 4-digit numbers can be formed using the digits 1, 2, 3, 4, 5, 6, 7 if repetition of digits is not allowed? 52) _____

53) A pollster wants to minimize the effect the order of the questions has on a person's response to a survey. How many different surveys are required to cover all possible arrangements if there are 6 questions on the survey? 53) _____

54) A tourist in France wants to visit 8 different cities. How many different routes are possible? 54) _____

Find the angle of smallest possible positive measure coterminal with the given angle.

55) 1318° 55) _____

Suppose that θ is in standard position and the given point is on the terminal side of θ. Give the exact value of the indicated trig function for θ.

56) (−15, 36); Find sin θ. 56) _____

57) (−3, 8); Find tan θ. 57) _____

Without using a calculator, give the exact trigonometric function values with rational denominators.

58) tan 45° 58) _____

59) cos 60° 59) _____

60) csc 45° 60) _____

Find the exact function value if it exists.

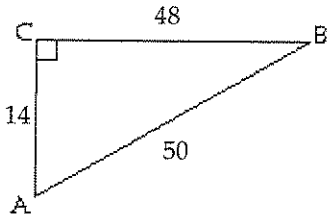
61) sin 225° 61) _____

62) sec (–135°) 62) _____

63) cot 120° 63) _____

Find the exact values of the indicated trigonometric functions. Write fractions in lowest terms.

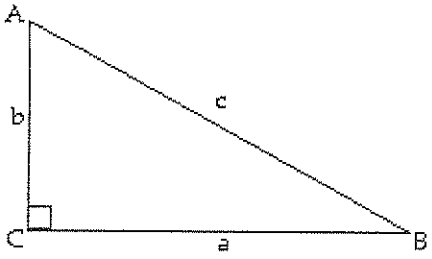
64) 64) _____



Find sin B and tan B.

Solve the right triangle for all missing sides and angles to the nearest tenth.

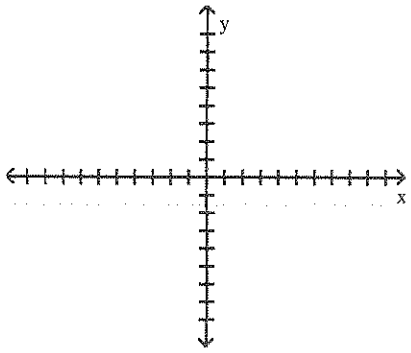
65) 65) _____



c = 31.3
B = 24.5°

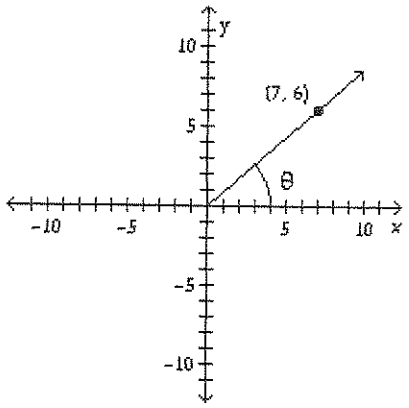
Sketch an angle θ in standard position such that θ has the smallest positive measure and the given point is on the terminal side of θ.

66) (3, 6) 66) _____



Find the six trigonometric function value for the angle shown.

67) 67) _____



Find the measures of two angles, one positive and one negative, that are coterminal with the given angle.

68) $-25°$ 68) _____

Convert to radian measure. Leave your answer in terms of π.

69) $-490°$ 69) _____

Convert to degree measure. Round to two decimal places, if necessary.

70) $\frac{5}{2}\pi$ 70) _____

Find the length of an arc intercepted by a central angle θ in a circle of radius r. Round your answer to 1 decimal place.

71) $r = 16.46$ in.; $\theta = 10°$ 71) _____

Find the area of a sector of a circle having the given radius r and central angle θ. Use 3.14 for π.

72) $r = 40.6$ cm, $\theta = \frac{\pi}{6}$ radians 72) _____