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1) If $f(x) = 9x^2 + 11x$, find f(3).

2) If $T{:}n \rightarrow \frac{n(n+1)}{2}$, find T(2).

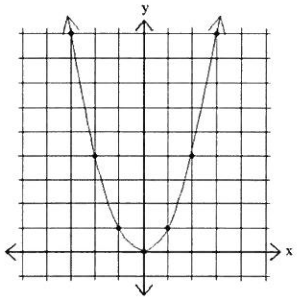
3) If $f(n) = n^2$ and $g(n) = -7n$, find f(g(2)) and g(f(-1))

4) In #3, find f(g(n)) and g(f(n)). Are they inverses of each other?

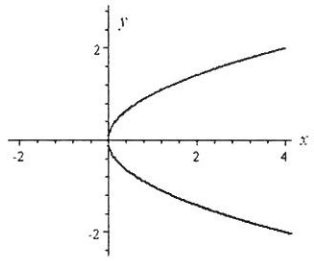
5) Determine whether the following are functions: (identify domain and range)

a) {(95, 5), (4, 4) (5, -5)}

b)



c)

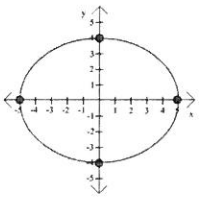


6) Given the equation $g(x) = 5x + 10$ find $g^{-1}(x)$.

7) How can you tell if a graph has an inverse which is a function?

8) Which are functions? Which have inverses that are functions?

a)



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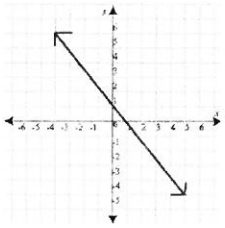

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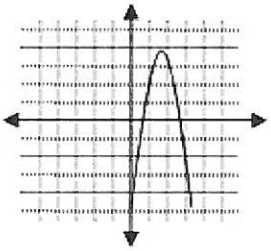

9a) Simplify $\sqrt[5]{96x^{15}y^3}$

9b) Simplify $\sqrt[2]{48x^4}$

10) Simplify $\left(\frac{4}{5}\right)^{-2}$

11) Simplify $(121)^{\frac{-1}{2}}$

12) Solve $x^{\frac{2}{3}} = 25$

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13) Solve $100(A-5)^4 = 1600$

14) Solve $c^{\frac{3}{2}} = 64$

15) $\sqrt{x+7} - 6 = 4$

16) What is the compound interest formula? (There are 2 formulas) What does each variable represent?

17) A bank pays 5.75% interest compounded quarterly. If you deposit $200 in the account and leave it untouched for 5 years, how much money will be in the account?

18) Find an explicit formula for the nth term in the *geometric* sequence
2, 8, 32, 128, ...

19) Find:
a) log 1000

b) $\log_4 \frac{1}{16}$

c) ln e^{-2}

d) $\log_5 10$

20) Find to the nearest hundredth:
a) ln (40.6)

b) log 30

21) Solve:
a) $e^x = 400$

b) log x = 4.7

c) $\log_x 8 = \frac{3}{4}$

d) $6^x = 35$

22) Write in exponential form:
a) log 45 ≈ 1.65

b) ln 15 ≈ 2.7

23) Write in logarithmic form:
a) $2^3 = 8$

b) $e^4 \approx 54.6$

24) Apply the property of logarithms:
$\log\left(\frac{M}{N^2}\right)$

25) Apply the property of logarithms and solve:
$2\log 7 + \log 13$

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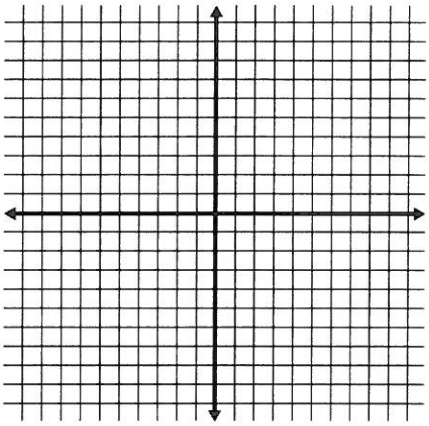
26) Lana invested some money in an account in which interest is compounded continuously. If the rate is 7%, how long will it take to double the money? (p. 597)

27) Graph y = 3^x and its inverse. Label both.



28) Evaluate:

a) 2^{-4}

b) $\left(\frac{3}{2}\right)^{-2}$

c) $100^{\frac{-1}{2}}$

d) $27^{\frac{2}{3}}$

e) re-write with a positive exponent
x^{-3}

29) Find the exact value

a) cos 210°

b) sin 120°

c) tan $\frac{\pi}{4}$

d) sin $\frac{\pi}{3}$

e) cos 2π

f) tan 360°

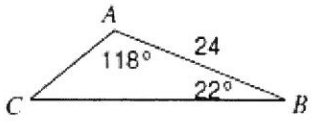
30a) What is the Law of Sines? When do you use the Law of Sines?

b) What is the Law of Cosines? When do you use the Law of Cosines?

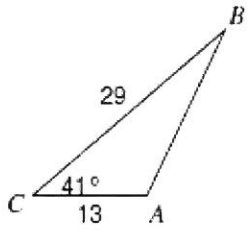
31) What is the period of sin Θ? What is the period of cos Θ? Write your answer in degrees and radians.

32) Given each of the following,

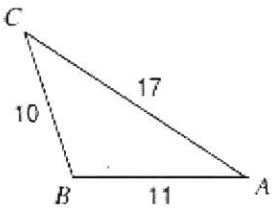
a) Find b.



b) Find c.



c) Find $m\angle A$.



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33) Simplify

a) $\sqrt{x^{20}}$

b) $\sqrt[3]{x^{21}}$

c) $\sqrt[5]{121}$, decimal to the nearest thousandth.

d) $\sqrt[6]{x^{19}}$

e) $\dfrac{-10x^5y^{\frac{4}{5}}}{5xy^{\frac{1}{5}}}$

34) Factor $25x^2 - 70x + 49$

35) Give all solutions.

$z^4 - 16 = 0$

36) Factor $6x^2 + 26x + 8$

37) Find the exact zeros of $P(x) = x^2 - 36$

38) Factor and find the zeros of the polynomial function.

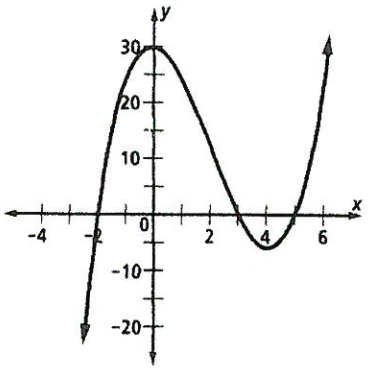
$r(t) = 2t^3 - t^2 - 21t$

39) What is the degree of the polynomial equation $P(x) = x^2 + x^4 - 5x^5$?

40) When $f(x) = x^4 + 3x - 22$ and $f(2) = 0$. Which of the following is a factor of $x^4 + 3x - 22$?

a) 0 b) 2 c) $x + 2$ d) $x - 2$

41) A polynomial function of degree three with integer zeros is graphed below. Write an equation of the polynomial function in factored form.



42) Divide $10x^7y^2 + 15x^3y^4$ by $5x^2$

43) Find all the zeros for the function

$P(x) = (x + 7)^2(x - \sqrt{3})(x - 2)^2$

44) Let $p(x) = 2x^2 + 3x - 9$.

a. Factor p(x).

b. Find the roots of the equation.

45) Multiply and simplify.

$(3p^2 - 4p + 1)(p + 5)$

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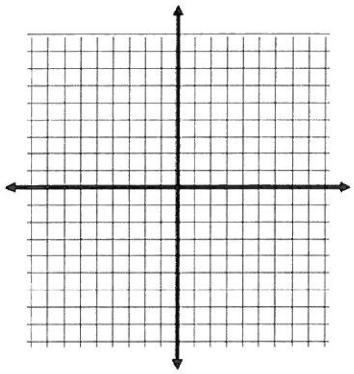
46) Graph $f(x) = 3 \cdot \left(\frac{1}{2}\right)^x$ on the coordinate axes. Identify the y-intercept and at least two other points.

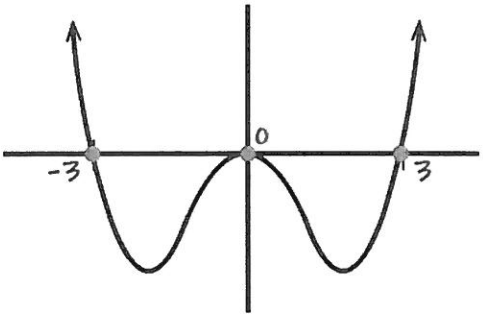


47) Angela invests $1000 in an account paying 4.2% compounded **continuously.**

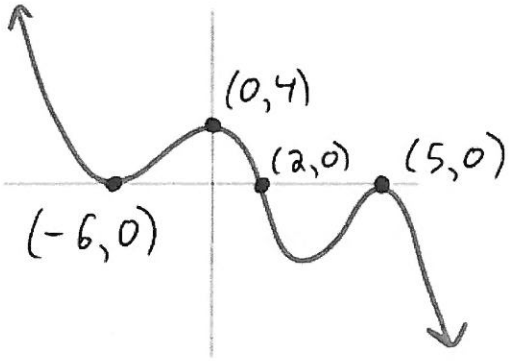
a) Write an equation representing this situation.

b) How much money will she have after 6 years?

48a) Given the following graph, write the general form of a 4th degree polynomial function.



48b) Given the following graph, write the general form of a 5th degree polynomial function.



49) Suppose $f(x) = 3x^2$ and $g(x) = 4x - 2$. Find:
a) f(g(3)) b) g(f(x))

50) Find the sum of the integers from 1 to 200.

51) Evaluate $\sum_{i=1}^{4} i^3$

52) Write without a radical in the denominator. Simplify.

a. $\frac{20}{\sqrt{5}}$

b. $\frac{a}{\sqrt{b}}$

c. $\frac{1}{3+\sqrt{x}}$

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53) How many times more intense is an earthquake with magnitude 8.5 on the Richter scale than one with magnitude 4.3?

54) What is the difference between a sequence and a series?

55) Convert $\frac{\pi}{4}$ radians to degrees.

56) Graph f(x) = | x — 2|

57) Let f(x) = x^2 and g(x) = 2x + 5
a) g(f(x)) =

b) f(g(x)) =

c) f(g(-2)) =

58) If f(x) = 4x + 7, then $f^{-1}(x) =$

59) Expand $(a + b)^4$

60) Evaluate $\binom{15}{3}$

61) Find the sum of all even integers from 20 to 298

62) Evaluate $\log_3 2187$

63) Solve for x: a) $3^x = 40$ b) $e^x = 13$

64) Give the exact value of $\cos\frac{5\pi}{4}$

65) The sum of the first 6 terms of the series 16 + 8 + 4 + ... is what number?

66) Simplify $\sqrt{a^{18}}$

67) Johnny received $525, $650, $700, and $975 from consecutive summer jobs. If x = 1 + r, what is the polynomial equation that models the final amount of money he has immediately after the last summer (no other money was added or withdrawn from the account)? Calculate the amount of money Felipe has if the annual interest rate is 3%.

68) How many ways can 8 people finish a race?

69) Complete sin 25° = cos _____

70) If P(4) = 0, what is a factor of a polynomial function P?

71) $\sum_{n=1}^{5}(4n - 3) =$

72) Write the explicit rule for the nth term of the geometric sequence:
108, 36, 12, 4, ...

73) Know how to solve for arithmetic and geometric sequences and series (chap 13 – sec 1-6, skip 13.3)