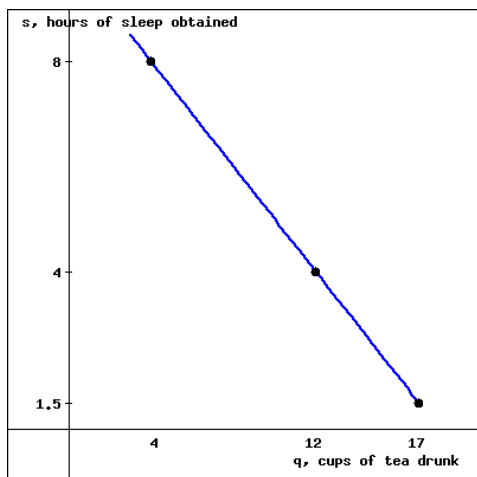


1. (1 point)

Find a formula for the linear equation graphed below. You can enlarge the graph by clicking on it.



(click on the image to enlarge)

$s = f(q) = \underline{\hspace{2cm}}$

Answer(s) submitted:

- $-0.5q+10$

(correct)

2. (1 point) Question 8:

Give the domain and range of $f(x) = x^2 + 1$:

a) What is the domain of $f(x)$?

[click here for help using interval notation](#)

b) What is the range of $f(x)$?

Answer(s) submitted:

- $(-\infty, \infty)$
- $[1, \infty)$

(correct)

3. (1 point)

Let $f(x) = x^2 + 5$ and $g(x) = x^2 + 4$. Find the following functions, and simplify each as much as possible: your final answer should be a polynomial with only one term in each power of x .

(a) $f(x) + g(x) = \underline{\hspace{2cm}}$

(b) $f(x) - g(x) = \underline{\hspace{2cm}}$

(c) $f(x)g(x) = \underline{\hspace{2cm}}$

(d) $\frac{f(x)}{g(x)} = \underline{\hspace{2cm}}$

(For part (d), you need not simplify as you did in (a)-(c).)

Answer(s) submitted:

- $2x^2+9$
- 1
- x^4+9x^2+20
- $(x^2+5)/(x^2+4)$

(correct)

4. (1 point) Find all zeros and vertical asymptotes of the rational function

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

If there is more than one answer, enter your answers as a comma separated list. If there is no solution, enter *NONE*. Do not leave a blank empty.

(a) The function has x-intercept(s) at $x = \underline{\hspace{2cm}}$ help (numbers)

(b) The function has y-intercept(s) at $y = \underline{\hspace{2cm}}$ help (numbers)

(c) The function has vertical asymptote(s) when $x = \underline{\hspace{2cm}}$ help (numbers)

(d) The function has horizontal asymptote(s) when $y = \underline{\hspace{2cm}}$ help (numbers)

Answer(s) submitted:

- -2, 2
- -1
- none
- 1

(correct)

5. (1 point) A wooden artifact from an ancient tomb contains 50 percent of the carbon-14 that is present in living trees. How long ago was the artifact made? (The half-life of carbon-14 is 5730 years.)

Your answer is years.

Answer(s) submitted:

- 5730

(correct)

6. (1 point)

Find the exact solution to the equation below.

$$\frac{\log(x^3) + \log(x^4)}{\log(100x)} = 3$$

$x = \underline{\hspace{2cm}}$

Answer(s) submitted:

- $1000000^{(1/4)}$

(correct)

7. (1 point) The number of students enrolled at ASU in 1999 was 42845. In 2007, the number of students enrolled at ASU was 44319. Use the midpoint formula to estimate the number of students enrolled at ASU in 2003.

Estimated number of students in 2003 = _____

Answer(s) submitted:

•

(incorrect)

8. (1 point)

Identify the function $f(x)$ if

$$j(x) = \sqrt{f(x)} = \sqrt{e^{(x^4+3)}}.$$

$f(x) =$ _____

Answer(s) submitted:

• $e^{(x^4+3)}$

(correct)

9. (1 point) Find a formula for the quadratic function whose graph has its vertex at $(-3, 2)$ and its y -intercept at $y = -4$.

$f(x) =$ _____ help (formulas)

Answer(s) submitted:

• $-2/3x^2 - 4x - 4$

(correct)

10. (1 point)

Is the function below exponential?

$$K(x) = \frac{9^x}{\sqrt{2} \cdot 4^x}$$

If so, write the function in the form $K(x) = ab^x$ and enter the values you find for a and b in the indicated blanks below. If the function is not exponential, enter **NONE** in both blanks below.

$a =$ _____

$b =$ _____

Answer(s) submitted:

• $2^{-0.5}$

• $9/4$

(correct)

11. (1 point)

Simplify the expression, as shown.

$$7e^{4\ln(A)} = __ A^{(__)}$$

Answer(s) submitted:

• 7

• 4

(correct)

12. (1 point)

A flight costs \$12,500 to operate, regardless of the number of passengers. Each ticket costs \$131. Express profit, P , as a linear function of the number of passengers, n , on the flight.

$P =$ _____ (do not enter commas in your formula)

Answer(s) submitted:

• $131n - 12500$

(correct)

13. (1 point)

Some equations involving x and y define y as a function of x , and others do not. For example, if $x + y = 1$ we can solve for y and obtain $y = 1 - x$ and we can then think of $y = f(x) = 1 - x$. On the other hand, if we have the equation $x = y^2$ then y is not a function of x since for a given non-negative value of x the value of y could equal the positive or the negative square root of x . Indicate by True (T) or False (F) whether the following equations define y as a function of x . You may assume that $0 \leq x \leq 1$.

- ___1. $y^2 + x = 1$
- ___2. $1x + 6y + 9 = 0$
- ___3. $y^2 + x^2 = 1$
- ___4. $|y| - x = 0$
- ___5. $y - |x| = 0$
- ___6. $y + x^2 = 1$
- ___7. $x + y = 1$

Answer(s) submitted:

- F
- T
- F
- f
- t
- t
- t

(correct)

14. (1 point) If

$$f(x) = \frac{4e^x - 11}{10e^x + 13}$$

then $f^{-1}(x) =$ _____

Give the domain of $f^{-1}(x)$ in **interval notation**:

Answer(s) submitted:

- $\ln((13x+11)/(4-10x))$
- $(-11/13, 4/10)$

(correct)

15. (1 point) Find the horizontal asymptote, if it exists, of the rational function below. If the function does not have a horizontal asymptote, enter **NONE**.

$$g(x) = \frac{(6-x)(-5-2x)}{6x^2 + 1}$$

The horizontal asymptote has equation _____ help (equations)

Answer(s) submitted:

- $y=2/6$

(correct)

16. (1 point) Find the number x such that

$$8^x = \frac{1}{4}.$$

$x =$ _____

Answer(s) submitted:

- $-2/3$

(correct)

17. (1 point)

Solve for the unknown variable.

$$\ln(x^7) - \ln(x^3) = 4$$

$x =$ _____

Answer(s) submitted:

- e

(correct)

18. (1 point) The equation of the line that goes through the point $(7, 10)$ and is perpendicular to the line $2x + 5y = 4$ can be written in the form $y = mx + b$ where m is: _____ and where b is: _____

Answer(s) submitted:

- $5/2$
- $-15/2$

(correct)

19. (1 point)

The domain of the function

$$f(x) = \frac{x+4}{x+2}$$

is the set of all real number except _____ and its range is the set of all numbers except _____

Hint: To find the domain observe that we can't divide by zero. To find the range solve an equation.

Answer(s) submitted:

- -2
- 1

(correct)

20. (1 point)

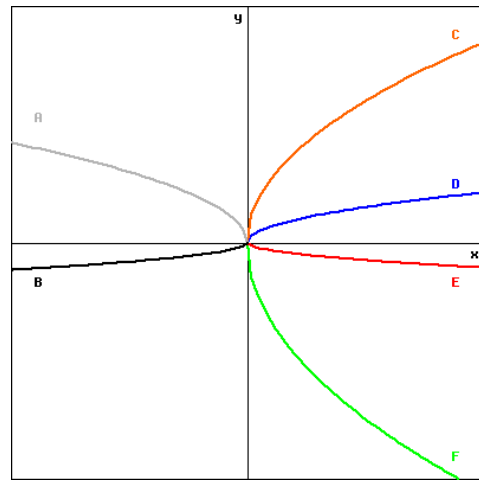
Let $f(x) = \sqrt{x}$. On a piece of paper, graph and label each function listed below. Then, match each formula with its graph.

$f(x)$

$4f(x)$

$-\frac{1}{2}f(x)$

$-5f(x)$



(Click on graph to enlarge)

Answer(s) submitted:

- D
- C
- E
- F

(correct)

21. (1 point) Find a possible formula for a polynomial f that has degree 2 or less, $f(1) = f(3) = 0$ and $f(2) = 2$.

$f(x) =$ _____ help (formulas)

Answer(s) submitted:

- $-2x^2+8x-6$

(correct)

22. (1 point)

Suppose you have a population (of some species, it doesn't matter which) that, over a long period, grows at a rate that causes it to double its size every 30 years. That rate is _____ percent. Suppose that in the year 2004, that population is 1,000,000.

The population will be _____ in the year 2034.

The population was _____ in the year 1974.

It was _____ in the year 1944.

In the year t the population is $f(t) =$ _____. (Your answer will depend on t . Make sure you have the term $t - 2004$ somewhere in an exponent.)

Hint: Use a formula of the form $f(t) = A2^{B(t-2004)}$, with suitable values of A and B .

Answer(s) submitted:

- $(1/30) * 100$
- 2000000

- 500000
- 250000
- $1000000 \cdot 2^{\lfloor (t-2004)/30 \rfloor}$

(score 0.800000011920929)

23. (1 point)

Calculate directly (without using a calculator.)

$$\log_{27} 3 + \log_{81} 3$$

Solution: _____

Answer(s) submitted:

- 7/12

(correct)

24. (1 point) An *isosceles triangle* is one where two sides have the same length and the third side has a possibly different length. Suppose you have an isosceles triangle where two sides have length a and the base has length b . Then the height of that triangle is $h =$ _____.

The area of your triangle is $A =$ _____.

Hint: Draw the right triangle and its height. Apply the Pythagorean Theorem. Use $\text{sqrt}(\dots)$ to enter the square root of something. The area of a triangle is one half times base times height.

Answer(s) submitted:

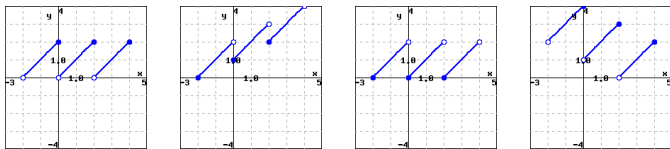
- $\text{sqrt}(a^2 - (0.5b)^2)$
- $(b \cdot \text{sqrt}(a^2 - (0.5b)^2)) / 2$

(correct)

25. (1 point) On a piece of paper, sketch a graph the piecewise-defined function below.

$$f(x) = \begin{cases} x + 2, & -2 \leq x < 0, \\ x + 0, & 0 \leq x < 2, \\ x - 2, & 2 \leq x < 4. \end{cases}$$

Which graph A-D below most closely matches the graph you drew? [?/A/B/C/D]



A B C D

(Click on a graph to enlarge it.)

Answer(s) submitted:

- C

(correct)

26. (1 point)

Suppose

$$f(x) = |x| \cdot x$$

Then

$$f^{-1}(x) = \text{_____ if } x \geq 0,$$

and

$$f^{-1}(x) = \text{_____ if } x \leq 0.$$

Hint: Compute the inverse function separately in the two cases. It may also help to draw the graph of f .

Answer(s) submitted:

- $\text{sqrt}(x)$
- $-\text{sqrt}(-x)$

(correct)

27. (1 point)

$$f(x) = \frac{-3x^4 - 9x^3 + x^2 - 8x - 6}{x^4 + 3x^3 - 8x^2 + 3x - 2}$$

What is the equation of the horizontal asymptote? $y =$ _____.

Does the graph of $f(x)$ intersect its horizontal asymptote? (yes or no) _____.

At what x -values does $f(x)$ intersect its horizontal asymptote? Give your answers in increasing order. If $f(x)$ does not intersect its horizontal asymptote, leave this question blank.

_____, _____

Answer(s) submitted:

- -3/1
- no
-
-

(correct)

28. (1 point)

What is the balance after 1 year of an account containing \$800 which earns a yearly nominal interest of 3% that is compounded (*round all answers to the nearest cent; do not include commas*) :

- (a) annually? \$ _____
- (b) weekly (there are 52 weeks per year)? \$ _____
- (c) every minute (there are 525,600 minutes per year)? \$ _____
- (d) continuously? \$ _____

Answer(s) submitted:

- 824
- 824.36
- 824.36
- 824.36

(correct)

29. (1 point)

Suppose that $x = \ln(A)$ and $y = \ln(B)$. Write the following expressions in terms of x and y (so you cannot have an A or B anywhere in your answers).

- (a) $\ln(AB) =$ _____ help (formulas)
- (b) $\ln(A^3 \cdot \sqrt{B}) =$ _____ help (formulas)
- (c) $\frac{\ln(A)}{\ln(B)} =$ _____ help (formulas)
- (d) $\ln\left(\frac{A}{B}\right) =$ _____ help (formulas)
- (e) $AB =$ _____ help (formulas)
- (f) $\ln(A - B) =$ _____ help (formulas)

Answer(s) submitted:

- x+y
- 3x+0.5y
- x/y
- x-y
- e^(x+y)
- ln((e^x)-(e^y))

(correct)

30. (1 point) Consider a circle with center $(3, -2)$ which has a point on the circle at $(-7, -6)$.

First, determine the radius of the circle: _____

Finally, an equation for the circle with center $(3, -2)$ and passing through $(-7, -6)$ is given by:

$$(x - \underline{\hspace{1cm}})^2 + (y - \underline{\hspace{1cm}})^2 = \underline{\hspace{1cm}}.$$

Answer(s) submitted:

- sqrt116
- 3
- -2
- 116

(correct)

31. (1 point)

Find the domain of each function. If the answer is all real numbers, enter "r" below.

- (a) $f(x) = \frac{1}{1+e^x}$
- (b) $f(x) = \frac{1}{1-e^x}$
- (a) $x =$ _____
- (b) $x \neq$ _____

Answer(s) submitted:

- r
- 0

(correct)

32. (1 point) Suppose that

$$f(x) = \frac{1}{x-5} \quad \text{and} \quad g(x) = \frac{x-6}{x+5}.$$

For each function h given below, find a formula for $h(x)$ and the domain of h . Use **interval notation** for entering the domains.

(A) $h(x) = (f \circ g)(x)$.

$h(x) =$ _____
Domain = _____

(B) $h(x) = (g \circ f)(x)$.

$h(x) =$ _____
Domain = _____

(C) $h(x) = (f \circ f)(x)$.

$h(x) =$ _____
Domain = _____

(D) $h(x) = (g \circ g)(x)$.

$h(x) =$ _____
Domain = _____

Answer(s) submitted:

- 1/(((x-6)/(x+5))-5)
- (-infinity, -31/4) U (-31/4, -5) U (-5, infinity)
-
-
- 1/((1/(x-5))-5)
- (-infinity, 5) U (5, 26/5) U (26/5, infinity)
-
-

(score 0.5)

33. (1 point) A pomegranate is thrown from ground level straight up into the air at time $t = 0$ with velocity 112 feet per second. Its height in feet at t seconds is $f(t) = -16t^2 + 112t$. Find the time it hits the ground and the time it reaches its highest point.

Hits the ground when $t =$ _____ (include **units**)

Reaches highest point when $t =$ _____ (include **units**)

Maximum height = _____ (include **units**)

Answer(s) submitted:

-

-
-

(incorrect)

34. (1 point) Find the solutions of the exponential equation

$$x^2 2^x - 2^x 15 = 0.$$

$x_1 = \underline{\hspace{2cm}}$ and $x_2 = \underline{\hspace{2cm}}$ with $x_1 < x_2$.

Answer(s) submitted:

- $-\sqrt{15}$
- $\sqrt{15}$

(correct)

35. (1 point)

Find the exact solution to the equation below. (*Do not give a decimal approximation.*)

$$\log(1-x) - \log(1+x) = 2.$$

$x = \underline{\hspace{2cm}}$ help (numbers)

Answer(s) submitted:

- $99/-101$

(correct)

36. (1 point) Consider the two points $(3, -1)$ and $(-8, -5)$.

The distance between them is: $\underline{\hspace{2cm}}$

The x co-ordinate of the midpoint of the line segment that joins them is: $\underline{\hspace{2cm}}$

The y co-ordinate of the midpoint of the line segment that joins them is: $\underline{\hspace{2cm}}$

Answer(s) submitted:

- 11.7047
- -2.5
- -3

(correct)

37. (1 point)

Enter below the definition of a function that is both even and odd:

$f(x) = \underline{\hspace{2cm}}$.

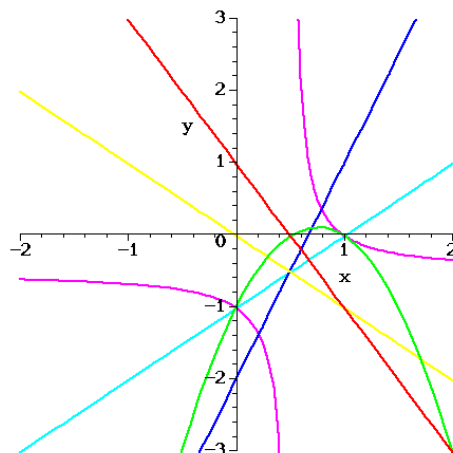
Hint: You might think of the circle. That's a good thought, but the circle does not define a function. There is only one function that is both even and odd. Go back to the definitions of *even* and *odd* and see where they lead you.

Answer(s) submitted:

- 0

(correct)

38. (1 point)



Let

$$f(x) = x - 1 \quad \text{and} \quad g(x) = 1 - 2x.$$

In the Figure above, match the colors of the graphs in this Figure with the functions given. Enter y for yellow, b for (dark) blue, r for red, p for purple, c for cyan (light blue), and g for green, as appropriate.

- ___ $y = f(x)$
- ___ $y = g(x)$
- ___ $y = (f + g)(x)$
- ___ $y = (f - g)(x)$
- ___ $y = (fg)(x)$
- ___ $y = \left(\frac{f}{g}\right)(x)$

Answer(s) submitted:

- C
- R
- Y
- B
- G
- P

(correct)

39. (1 point)

Find the inverse function (if it exists) of $h(x) = 8x^3 - 3$. If the function is not invertible, enter **NONE**.

$h^{-1}(x) = \underline{\hspace{2cm}}$

(Write your inverse function in terms of the independent variable x .)

Answer(s) submitted:

- $((x+3)/8)^{(1/3)}$

(correct)

40. (1 point)

Solve for x : $6^x = e^{x+1}$

$x =$ _____

Answer(s) submitted:

- $1 / (\ln 6 - 1)$

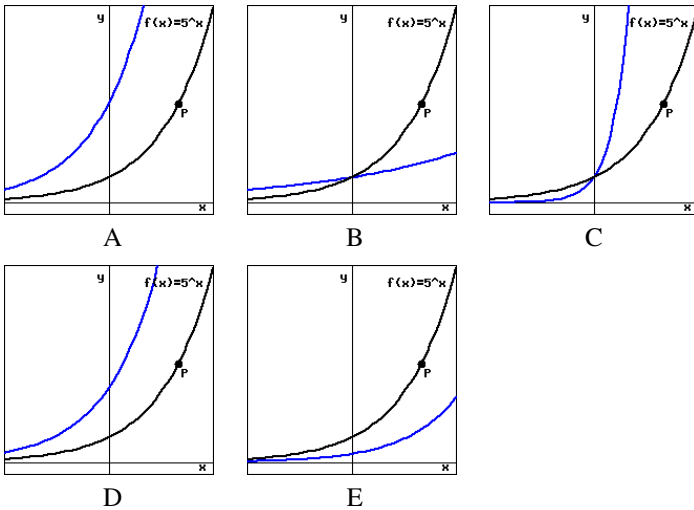
(correct)

41. (1 point)

In each of the graphs A-E below, a possible graph of $f(2x)$ is given in blue on the same axis as the origin function $f(x) = 5^x$ drawn in black.

(a) Which of the graphs A-E matches your graph? [?/A/B/C/D/E]

(b) Where does the point $P = (2, 25)$ marked on the graph of $f(x)$ get moved to on the new graph of $f(2x)$? The point on the new graph is _____



(Click on a graph to enlarge it.)

Answer(s) submitted:

- C
- (1, 25)

(correct)

42. (1 point)

Find the equations of the lines that pass through the point (8, 8) and are parallel to and perpendicular to the line with equation $y + 3x = 8$.

Parallel: $y =$ _____

Perpendicular: $y =$ _____

Answer(s) submitted:

- $-3x+32$
- $1/3x+16/3$

(correct)

43. (1 point) Consider the equation

$$x^2 + y^2 + Ax + By + C = 0.$$

It describes a circle with center (h, k) and radius r where

$h =$ _____,

$k =$ _____, and

$r =$ _____.

Enter your answers as algebraic expressions in A , B , and C . Remember that WeBWorK (and mathematics) is case sensitive so in this case your variables are capital letters, and you must enter them as such.

Hint: Complete the square in x and in y .

Answer(s) submitted:

- $-0.5A$
- $-0.5B$
- $\text{sqrt}(-C + (0.5B)^2 + (0.5A)^2)$

(correct)

44. (1 point)

The domain of the function

$$f(x) = \sqrt{4x - x^2}$$

is the interval

_____ , _____ ,

and its range is

_____ , _____ .

Hint: Ask when is the radicand non-negative. You may find it useful to complete the square under the square root.

Answer(s) submitted:

- [
- 0
- 4
-]
- [
- 0
- 2
-]

(correct)

45. (1 point) How does the symmetry of $f(x) = \frac{p(x)}{q(x)}$ depend on the symmetry of $p(x)$ and $q(x)$? Select all true statements. There may be more than one correct answer.

- A. If $p(x)$ is odd and $q(x)$ is even, then $f(x)$ is odd.
- B. If $p(x)$ and $q(x)$ are both even, then $f(x)$ is even.
- C. If $p(x)$ and $q(x)$ are both odd, then $f(x)$ is even.
- D. If $p(x)$ is even and $q(x)$ is odd, then $f(x)$ is odd.
- E. If $p(x)$ or $q(x)$ is neither even nor odd, then $f(x)$ is neither even nor odd.
- F. If $p(x)$ and $q(x)$ are both odd, then $f(x)$ is odd.
- G. If $p(x)$ is even and $q(x)$ is odd, then $f(x)$ is even.
- H. If $p(x)$ is odd and $q(x)$ is even, then $f(x)$ is even.

Answer(s) submitted:

- (A, B, C, D)

(correct)

46. (1 point)

Find the inverse function of $g(x) = \frac{\sqrt{x+4}}{7-\sqrt{x}}$. If the function is not invertible, enter **NONE**.

$g^{-1}(x) =$ _____

(Write your inverse function in terms of the independent variable x .)

Answer(s) submitted:

- $((7x-4)/(1+x))^2$

(correct)

47. (1 point)

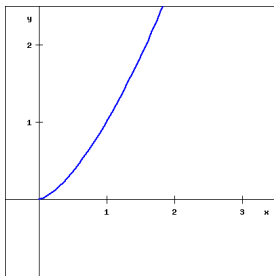
Let $f(x) = x^{3/2}$. On a piece of paper, graph and label each function listed below. Then, match each formula with its graph.

$y = x^{3/2} - 1$

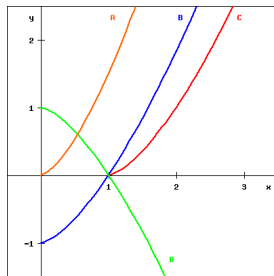
$y = (x-1)^{3/2}$

$y = 1 - x^{3/2}$

$y = \frac{3}{2}x^{3/2}$



$f(x) = x^{3/2}$



(Click on a graph to enlarge it)

Answer(s) submitted:

- B
- C
- D
- A

(correct)

48. (1 point) The equation

$$x^2 - 8x + y^2 - 6y - 50 = 0$$

defines a circle with center (__ , __) and radius __.

Hint: Complete the square in x and in y .

Answer(s) submitted:

- 4
- 3
- $5\sqrt{3}$

(correct)

49. (1 point) Find the perimeter of the triangle with the vertices at $(0, -1)$, $(-2, 4)$, and $(-3, -2)$.

Answer(s) submitted:

- $\sqrt{29} + \sqrt{10} + \sqrt{37}$

(correct)

50. (1 point)

Let $A = f(r)$ be the area of a circle with radius r and $r = h(t)$ be the radius of the circle at time t .

Which of the following statements correctly provides a practical interpretation of the composite function $f(h(t))$? Select all that apply if more than one is appropriate.

- A. At what time t the area will be $A = f(r)$.
- B. The length of the radius of a circle with area $A = f(r)$ at time t .
- C. At what time t the radius will be $r = h(t)$.
- D. The area of the circle at time t .
- E. The area of the circle which at time t has radius $h(t)$.
- F. The length of the radius at time t .
- G. None of the above

Answer(s) submitted:

- (D, E)

(correct)

51. (1 point) Let $A = f(r)$ be the area of a circle of radius r .

(a) Write a formula for $f(r) =$ _____ help (formulas)

(b) Which expression represents the area of a circle whose radius is increased by 10%?

- A. $f(r+0.1)$
- B. $f(10+r)$
- C. $0.1f(r)$
- D. $f(r)+0.1$
- E. $f(1.1r)$

(c) By what percent does the area increase if the radius is increased by 10%?

_____ % (round to the nearest 0.01%) help (numbers)

Answer(s) submitted:

- $\pi * r^2$
- E
- 21

(correct)

52. (1 point)

Suppose that $j(x) = h^{-1}(x)$ and that both j and h are defined for all values of x . Let $h(8) = 4$ and $j(7) = -3$. Evaluate if possible and enter the value of the expression in the blank. If you do not have enough given information to evaluate the expression, enter **unknown** in the blank beside the expression.

- (a) $h(7) =$ _____
- (b) $j(4) =$ _____
- (c) $j(8) =$ _____
- (d) $h(j(8)) =$ _____
- (e) $j^{-1}(-3) =$ _____
- (f) $j(h(8)) =$ _____
- (g) $h^{-1}(-3) =$ _____
- (h) $(h(-3))^{-1} =$ _____
- (i) $(h(4))^{-1} =$ _____

Answer(s) submitted:

- unknown
- 8
- unknown
- 8
- 7
- 8
- unknown
- 1/7
- unknown

(correct)

53. (1 point)

Before calculators were widely available people used logarithm tables to simplify multiplication and division, using the fact that the logarithm of a product equals the sum of the logarithms and the logarithm of the quotient equals the difference of the logarithms.

These tables were constructed by computing laboriously and carefully the logarithms of a few selected numbers and then combining the logarithms using the rules just mentioned.

This exercise suggest how the process may have worked.

Let

$$L(x) = \log_a(x)$$

where we don't know the base a . However, we do know that

$$L(2) = 0.32753 \quad \text{and} \quad L(3) = 0.51913.$$

Use this information to compute

$$L(6) = \text{_____}$$

$$L(9) = \text{_____}$$

$$L(12) = \text{_____}$$

$$L\left(\frac{2}{3}\right) = \text{_____}$$

$$L(3^{10}) = \text{_____}$$

$$L(1) = \text{_____}$$

Answer(s) submitted:

- 0.84666
- 1.03826
- 1.17419
- -0.1916
- 5.1913
- 0

(correct)

54. (1 point) Let $f(x) = \sqrt{x+1}$ and $g(x) = 2x - 4$. Find $f \circ g$ and $g \circ f$, and their respective domains.

1. $(f \circ g)(x) =$ _____

2. What is the domain of $f \circ g$?

Answer (in interval notation): _____

3. $(g \circ f)(x) =$ _____

4. What is the domain of $g \circ f$?

Answer (in interval notation): _____

Answer(s) submitted:

- sqrt (2x-3)
- [3/2, infinity)
- 2sqrt (x+1) -4
- [-1, infinity)

(correct)

55. (1 point)

Let $u(x) = e^{2x}$ and $v(x) = 4x + 2$. Find a simplified formula for the function below.

$$\left(v(u(x))\right)^2 = \text{_____} + \text{_____} + \text{_____}$$

Answer(s) submitted:

- $16e^{(2x)}$
- $16e^{(4x)}$
- 4

(correct)

56. (1 point)

The function $f(x) = x^2 + 6x + 16$ can be obtained from an even function g by shifting its graph horizontally and vertically.

That even function is $g(x) =$ _____.

Its graph has been shifted by _____ to the left and _____ up.

Hint: Complete the Square.

Answer(s) submitted:

- $x^2+6x+9-9+16$
- 3
- 7

(score 0.6666666865348816)

57. (1 point)

Let $f(x) = \sqrt{7-6x}$.

Which of the following decompositions of $f(x) = p(q(x))$ into a pair of functions $p(x)$ (the outside function) and $q(x)$ (the inside function) is/are correct? Select all that apply if more than one is appropriate.

- A. $p(x) = 7 - 6x$ and $q(x) = \sqrt{x}$
- B. $p(x) = \sqrt{7-x}$ and $q(x) = 6x$
- C. $p(x) = \sqrt{-x}$ and $q(x) = 6x - 7$
- D. $p(x) = \sqrt{x}$ and $q(x) = 7 - 6x$
- E. $p(x) = \sqrt{7+x}$ and $q(x) = 6x$
- F. $p(x) = \sqrt{-6x}$ and $q(x) = 7 + x$
- G. All of the above
- H. None of the above

Answer(s) submitted:

- (B, C, D)

(correct)

58. (1 point)

Consider the functions $f(x) = \sqrt[5]{\frac{x-5}{8}}$, $g(x) = \sqrt[5]{\frac{x}{8}} - 5$, $h(x) = \sqrt[5]{\frac{x+5}{8}}$, $p(x) = 5 + 8x^5$, $q(x) = -5 + 8x^5$, and $r(x) = \sqrt[5]{\frac{x}{8}} + 5$. Which of these functions are inverses of each other?

- A. $h(x)$ and $p(x)$
- B. $g(x)$ and $q(x)$
- C. $g(x)$ and $p(x)$
- D. $h(x)$ and $q(x)$
- E. $f(x)$ and $q(x)$
- F. $q(x)$ and $r(x)$
- G. $p(x)$ and $r(x)$
- H. $f(x)$ and $p(x)$
- I. No pairs of these functions are inverses of each other.

Answer(s) submitted:

- (D, H)

(correct)

59. (1 point)

Find the interval on which the function $f(x) = |x+2|$ is increasing:

Answer(s) submitted:

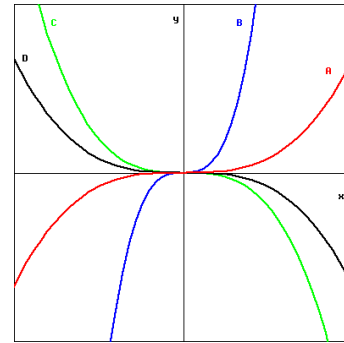
- $(-2, 0)$

(incorrect)

60. (1 point)

The figure below contains the graphs of four functions $f(x)$, $f(\frac{1}{2}x)$, $f(-2x)$, and $f(-\frac{1}{2}x)$.

Identify which graph A-D is paired with each of the four functions by entering the correct letter in the answer box beside each expression.



(click on image to enlarge)

- (a) $f(x)$ is graph ____ (enter a letter A-D)
- (b) $f(\frac{1}{2}x)$ is graph ____ (enter a letter A-D)
- (c) $f(-2x)$ is graph ____ (enter a letter A-D)
- (d) $f(-\frac{1}{2}x)$ is graph ____ (enter a letter A-D)

Answer(s) submitted:

- C
- D
- B
- A

(correct)