Test #2 25 QUESTIONS MATH1314 09281700 COLLEGE ALGEBRA

Name_____aat2m1314bli2810s11aw

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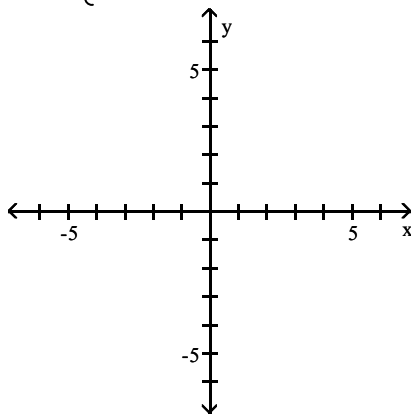
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Graph the function.

1) $f(x) = \begin{cases} x + 4 & \text{if } x < 1 \\ -1 & \text{if } x \geq 1 \end{cases}$ 1) _____



ALVAREZ--**VIDEO 17 m49–6 m50–10 math102 #24 mathlab44 #5**

Find and simplify the difference quotient $\frac{f(x+h) - f(x)}{h}$, $h \neq 0$ for the given function.

2) $f(x) = x^2 + 6x + 4$ 2) _____

ALVAREZ-- **VIDEO 18 m49–7 m50–11 math102 #25 mathlab44 #6**

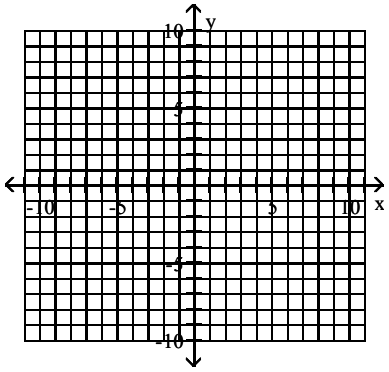
Find the domain of the function.

3) $f(x) = \sqrt{19 - x}$ 3) _____

ALVAREZ––VIDEO 23 m49–9 m50–12 math102 #30 mathlab44 #7

Graph the equation.

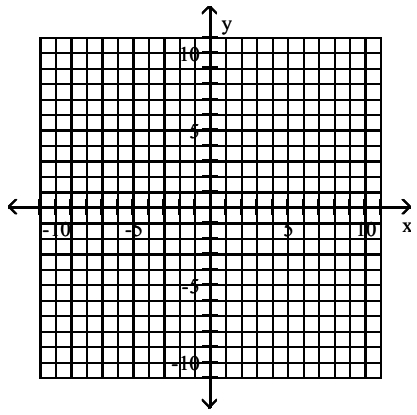
4) $x^2 + y^2 - 6x - 12y + 29 = 0$ 4) _____



ALVAREZ––**VIDEO 36 m49–17 m50–17 math102 #41 mathlab44 #12**

Use the vertex and intercepts to sketch the graph of the quadratic function.

5) $f(x) = -x^2 - 8x - 7$ 5) _____



ALVAREZ--**VIDEO 38 m49–19 m50–20,21 math102 #43**
mathlab44 #13,14,15,16

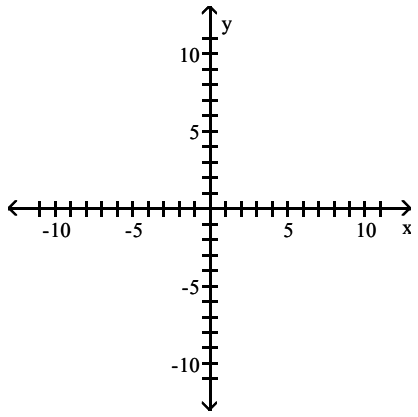
Solve the problem.

6) An arrow is fired into the air with an initial velocity of 64 feet per second. The height in feet of the arrow t seconds after it was shot into the air is given by the function $h(x) = -16t^2 + 64t$. Find the maximum height of the arrow. 6) _____

ALVAREZ--VIDEO 39 m49–20 math102#44,45,46

Graph the polynomial function.

7) $f(x) = x^3 - 2x^2 - 5x + 6$ 7) _____



ALVAREZ––VIDEO 43 math102 #50 mathlab44 #18

Use synthetic division to show that the number given to the right of the equation is a solution of the equation, then solve the polynomial equation.

8) $x^3 - 3x^2 - 10x + 24 = 0; 2$ 8) _____

ALVAREZ––VIDEO 45 m49–23 m50–22 math102 #54 mathlab44#17

Find a rational zero of the polynomial function and use it to find all the zeros of the function.

9) $f(x) = x^3 - 7x^2 + 19x - 13$ 9) _____

ALVAREZ––VIDEO 47 m49–24 m50–23 math102 #54 mathlab44 #18

Find the vertical asymptotes, if any, of the graph of the rational function.

10) $\dfrac{x - 36}{x^2 - 11x + 24}$ 10) _____

ALVAREZ––VIDEO 54 m49– 27 m50–26 math102 #56 mathlab44 #21

Find the horizontal asymptote, if any, of the graph of the rational function.

11) $g(x) = \dfrac{5x^2 - 8x - 7}{9x^2 - 3x + 3}$ 11) _____

ALVAREZ––VIDEO 56 m49–29 m50–28 math102 #57 mathlab44 #23

Find the slant asymptote, if any, of the graph of the rational function.

12) $f(x) = \dfrac{x^2 + 2x - 2}{x - 8}$ 12) _____

ALVAREZ--VIDEO 57 m49–30 m50–25 math102 #58 mathlab44 #20

Solve the problem.

13) The size of the beaver population at a national park increases at the rate of 5.1% per year. If the size of the current population is 180, find how many beavers there should be in 4 years. Use the function $f(x) = 180e^{0.051t}$ and round to the nearest whole number. 13) _____

ALVAREZ--VIDEO 60 m50–29

14) The function $D(h) = 6e^{-0.4h}$ can be used to determine the milligrams D of a certain drug in a patient's bloodstream h hours after the drug has been given. How many milligrams (to two decimals) will be present after 8 hours? 14) _____

ALVAREZ––VIDEO 62 m50–29

Find the domain of the logarithmic function.

15) $f(x) = \ln(2 - x)$ 15) _____

ALVAREZ––VIDEO 63 m49–31 m50–30 mathlab44 #24

Use properties of logarithms to expand the logarithmic expression as much as possible. Where possible, evaluate logarithmic expressions without using a calculator.

16) $\log_a \left(\dfrac{x^4 \sqrt[3]{x+5}}{(x-2)^2} \right)$ 16) _____

ALVAREZ––VIDEO 66 m49–32 m50–31,32 mathlab44 #25,26

Solve the equation by expressing each side as a power of the same base and then equating exponents.

17) $25^{x+7} = 125^{x-2}$ 17) _____

ALVAREZ––VIDEO 70 m49–33 m50–33 mathlab44 #27

Solve the exponential equation. Use a calculator to obtain a decimal approximation, correct to two decimal places, for the solution.

18) $3^{x+6} = 8$ 18) _____

ALVAREZ VIDEO 73 M50–34

Solve the logarithmic equation. Be sure to reject any value that is not in the domain of the original logarithmic expressions. Give the exact answer.

19) $\log_4 (x + 4) + \log_4 (x - 2) = 2$ 19) _____

ALVAREZ––VIDEO 76 m49–37 m50–35,36,37 mathlab44 #30

20) $\log (4 + x) - \log (x - 4) = \log 3$ 20) _____

ALVAREZ VIDEO79 M50–37

21) $\ln x + \ln (x - 1) = \ln 12$ 21) _____

ALVAERZ––VIDEO 80 m49–41 m50–38 mathlab44 #32

Solve the problem.

22) Find out how long it takes a $3100 investment to double if it is invested at 8% compounded semiannually. Round to the nearest tenth of a year. Use the formula $A = P\left(1 + \frac{r}{n}\right)^{nt}$. 22) _____

ALVAREZ VIDEO81 M50–39

23) The function $A = A_0e^{-0.00693x}$ models the amount in pounds of a particular radioactive material stored in a concrete vault, where x is the number of years since the material was put into the vault. If 700 pounds of the material are placed in the vault, how much time will need to pass for only 375 pounds to remain? 23) _____

ALVAREZ––VIDEO 83 m49–43 m50–40 mathlab44 #34

24) The population of a certain country is growing at a rate of 2.6% per year. How long will it take for this country's population to double? Use the formula $t = \frac{\ln 2}{k}$, which gives the time, t, for a population with growth rate k, to double. (Round to the nearest whole year.) 24) _____

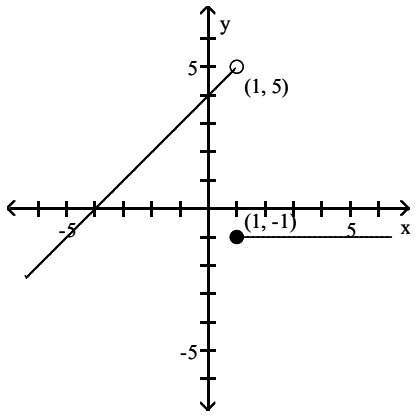
ALVAREZ––VIDEO 84 m49–44 m50–43 mathlab44 #37

Solve.

25) A fossilized leaf contains 9% of its normal amount of carbon 14. How old is the fossil (to the nearest year)? Use 5600 years as the half–life of carbon 14. 25) _____

ALVAREZ––VIDEO 87

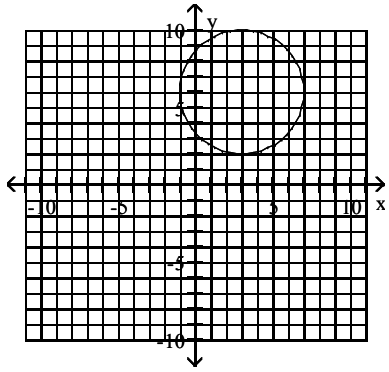
1)



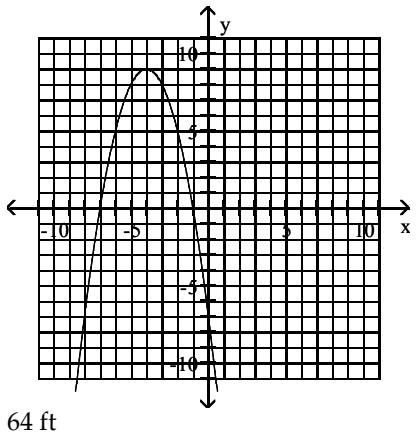
2) 2x + h + 6

3) (−∞, 19]

4)

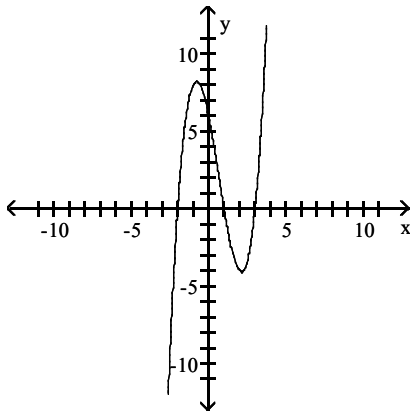


5)



6) 64 ft

7)



8) {4, –3, 2}
9) {1, 3 + 2i, 3 – 2i}
10) x = 8, x = 3
11) $y = \frac{5}{9}$
12) y = x + 10
13) 221
14) 0.24 mg
15) (–∞, 2)
16) $4 \log_a x + \frac{1}{3} \log_a (x + 5) - 2 \log_a (x - 2)$
17) {20}
18) –4.11
19) {4}
20) {8}
21) {4}
22) 8.8 years
23) 90 years
24) 27 years
25) 19,419