Test #4 33 QUESTIONS MATH1314 09281700 COLLEGE ALGEBRA

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

Solve the equation by factoring.

1) $15x^2 + 26x + 8 = 0$ 1) _____

ALVAREZ VIDEO 4 M50–3,4,5,8 M44–1,2 M102 5,9,11,12

Solve the equation using the quadratic formula.

2) $x^2 + 14x + 58 = 0$ 2) _____

ALVAREZ VIDEO 8 M50–7

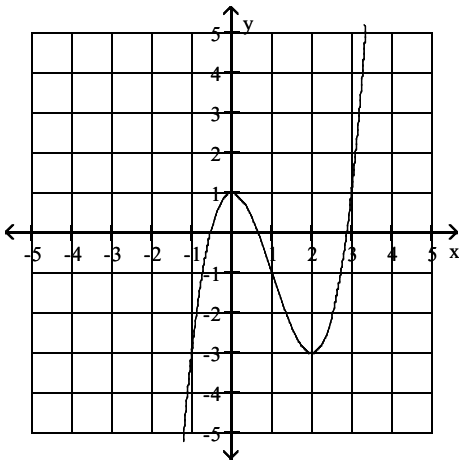
Solve the radical equation, and check all proposed solutions.

3) $\sqrt{30x + 15} = x + 8$ 3) _____

ALVAREZ **VIDEO 9 m49–3 m50–9 math102 #16 math44 #4**

Use the graph of the given function to find any relative maxima and relative minima.

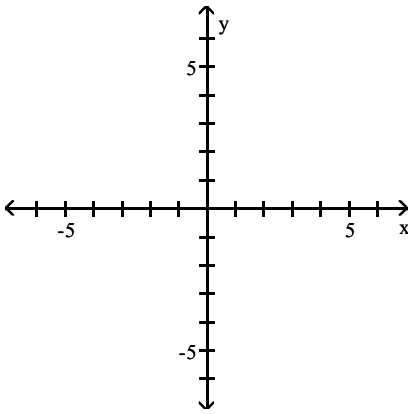
4) $f(x) = x^3 - 3x^2 + 1$ 4) _____



ALVAREZ VIDEO 15 M49–5 M102–21,22

Graph the function.

5) $f(x) = \begin{cases} x + 1 & \text{if } x < 1 \\ 4 & \text{if } x \geq 1 \end{cases}$ 5) _____



ALVAREZ **VIDEO 17 m49–6 m50–10 math102 #24 math44 #5**

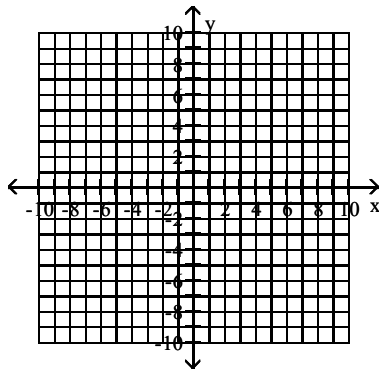
Find and simplify the difference quotient $\frac{f(x+h)-f(x)}{h}$, $h \neq 0$ for the given function.

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

ALVAREZ **VIDEO 18 m49–7 m50–11 math102 #25 math44 #6**

Begin by graphing the standard absolute value function $f(x) = |x|$. Then use transformations of this graph to graph the given function.

7) $h(x) = |x - 3| - 3$ 7) _____



ALVAREZ **VIDEO 21 m49–8**

Find the domain of the function.

8) $f(x) = \sqrt{18 - x}$ 8) _____

ALVAREZ VIDEO 23 m49–9 m50–12 math102 #30 math44 #7

Given functions f and g, perform the indicated operations.

9) $f(x) = 2x - 6$, $g(x) = 9x - 8$ 9) _____

Find $f - g$.

VIDEO ALVAREZ 25 M50–13 M49–10 M102–31 M44–8

10) $f(x) = 3x + 2$, $g(x) = 2x + 8$ 10) _____

Find fg.

ALVAREZ VIDEO 28 M50–13

For the given functions f and g , find the indicated composition.

11) $f(x) = 4x^2 + 3x + 6$, $g(x) = 3x - 4$ 11) _____

$(g \circ f)(x)$

ALVAREZ VIDEO 31 m49–14 m50–14 math102 #35 math44 #9

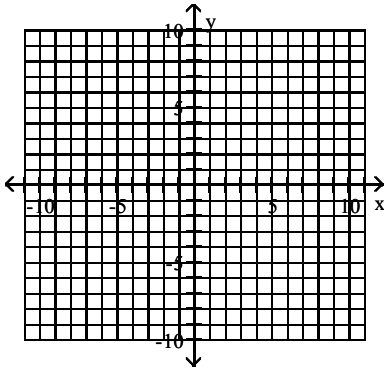
Find the distance between the pair of points.

12) (–1, –3) and (–7, 5) 12) _____

ALVAREZ VIDEO 33 m49–15 m50–15 math102 #38 math44 #10

Graph the equation.

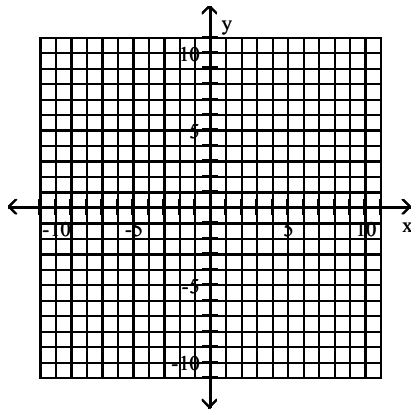
13) $x^2 + y^2 - 8x - 4y + 11 = 0$ 13) _____



ALVAREZ VIDEO 36 m49–17 m50–17 math102 #41 m,ath44 #12

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

14) $f(x) = -x^2 - 2x + 3$ 14) _____



ALVAREZ VIDEO 38 M50–20 M49–19 M102–43 M44–13,14,15,16

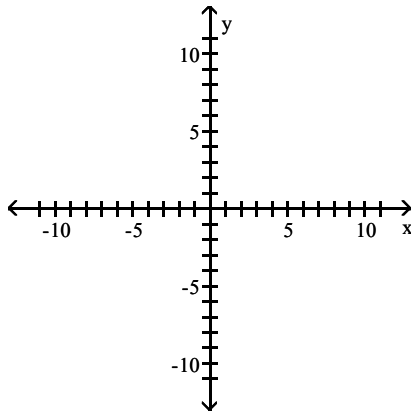
Solve the problem.

15) An arrow is fired into the air with an initial velocity of 160 feet per second. The height in feet of the arrow t seconds after it was shot into the air is given by the function $h(x) = -16t^2 + 160t$. Find the maximum height of the arrow. 15) _____

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

Graph the polynomial function.

16) $f(x) = x^3 + 4x^2 + x - 6$ 16) _____



ALVAREZ VIDEO 43 m49–22 m50–23 math102 #50 math44 #18

Solve the polynomial equation. In order to obtain the first root, use synthetic division to test the possible rational roots.

17) $x^3 + 8x^2 - 18x + 20 = 0$ 17) _____

ALVAREZ VIDEO 49 m49–24 m50–22 m102–50 m44–17

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

18) $\dfrac{x - 49}{x^2 - 7x + 10}$ 18) _____

ALVAREZ VIDEO 54 m49–27 m50–26 math102 #56 math44 #21

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

19) $f(x) = \dfrac{x^2 + 6x - 5}{x - 4}$ 19) _____

ALVAREZ VIDEO 57 m49–30 m50–25 math102 #58 math44 #20

Find the domain of the logarithmic function.

20) $f(x) = \ln (8 - x)$ 20) _____

ALVAREZ VIDEO 63 m49–31 m50–30 math102 #61 math44 #24

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

21) $\log\left[\dfrac{4x^4\sqrt[3]{5-x}}{6(x+5)^2}\right]$ 21) _____

ALVAREZ VIDEO 67 m49–32 m50–31,32 m102–62,63,64 m44–25,26 #62,63,64 math44 25,26

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

22) $16^{x+7} = 64^{x-10}$ 22) _____

ALVAREZ VIDEO 70 m49–33 m50–33 math102 #65 math44 #27

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

23) $3^{x+6} = 8$ 23) _____

ALVAREZ VIDEO 73 M50–34 M44–28 M49–36

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.

24) $\log_4 (x - 1) + \log_4 (x - 7) = 2$ 24) _____

ALVAREZ VIDEO 76 m49–37 m50–35 math102 #75 math44 #30

25) $\log_4 (x + 2) - \log_4 x = 2$ 25) _____

ALVAREZ VIDEO 78 M50–37

26) $\log (4 + x) - \log (x - 4) = \log 3$ 26) _____

ALVAREZ VIDEO 79 M50–37

27) $\ln x + \ln (x - 1) = \ln 72$ 27) _____

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ALVAERZ VIDEO 80 m49–40,41 m50–36,37,38 math102 #81 math44 #32

Solve the problem.

28) 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 $A = P\left(1 + \frac{r}{n}\right)^{nt}$. 28) _____

ALVAREZ VIDEO 81 M50–39

29) The function $A = A_0e^{-0.00866x}$ 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 900 pounds of the material are placed in the vault, how much time will need to pass for only 159 pounds to remain? 29) _____

ALVAREZ VIDEO 83 M50–40,42 M49–43 M44–34

30) The population of a certain country is growing at a rate of 2.1% 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.) 30) _____

ALVAREZ VIDEO 84 m49–44 m50–43 math102 #72 math44 #37

Solve the system of equations.

31) $x + y + z = 2$
$x - y + 2z = -1$
$2x + y + z = 1$ 31) _____

ALVAREZ VIDEO 89 m49–46 m50–44 math102 #91 math44 #38

Find the indicated sum.

32) $\sum_{i=3}^{5} (i^2 + 6)$ 32) _____

ALVAREZ VIDEO 98 m49–47 m50–45 math102 #96 math44 #39

Write the first three terms in the binomial expansion, expressing the result in simplified form.

33) $(x + 2)^{16}$ 33) _____

ALVAREZ VIDEO 100 m49–49 m50–49 math102 #100,101 math44 #40

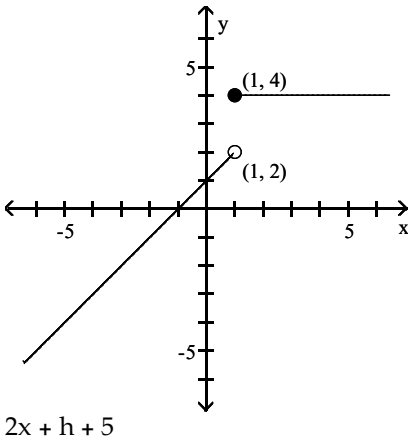
1) $\left\{-\frac{4}{3}, -\frac{2}{5}\right\}$

2) {–7 + 3i, –7 – 3i}

3) {7}

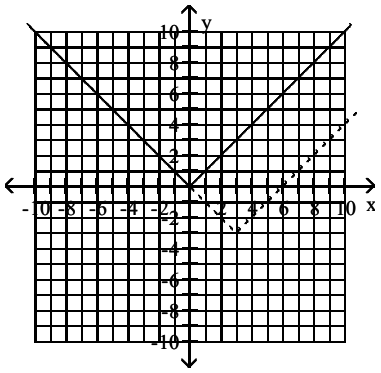
4) maximum: (0, 1); minimum: (2, –3)

5)



6) 2x + h + 5

7)



8) (–∞, 18]

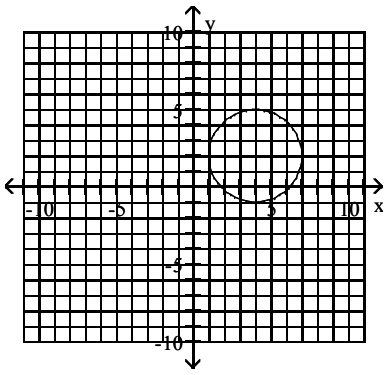
9) –7x + 2

10) $6x^2 + 28x + 16$

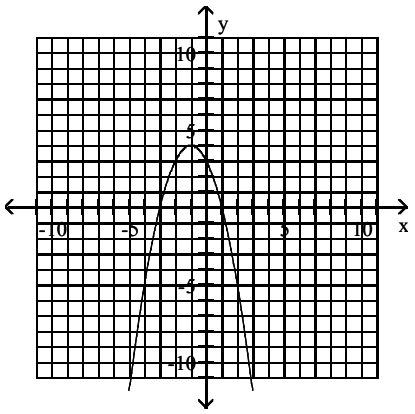
11) $12x^2 + 9x + 14$

12) 10

13)

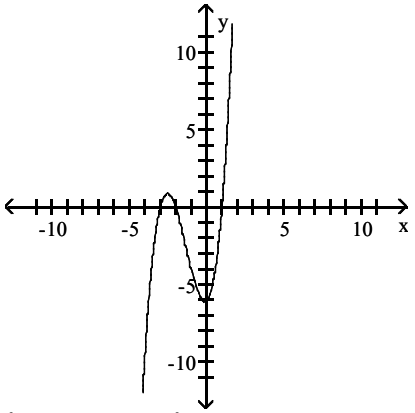


14)



15) 400 ft

16)



17) {1 + i, 1 – i, –10}

18) x = 2, x = 5

19) y = x + 10

20) (–∞, 8)

21) $\log 4 + 4\log x + \frac{1}{3}\log (5 - x) - \log 6 - 2\log (x + 5)$

22) {44}

23) –4.11

24) {9}

25) $\{\frac{2}{15}\}$

26) {8}

27) {9}

28) 8.8 years

29) 200 years

30) 33 years

31) {(–1, 2, 1)}

32) 68

33) $x^{16} + 32x^{15} + 480x^{14}$