PRETEST EXAM REVIEW 30 QUESTIONS MATH1314 January 22 2015 Spring 2015 COLLEGE ALGEBRA

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INTERACTMATH (BLITZER COLLEGE ALGEBRA 5e)
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the equation using the quadratic formula.

1) $x^2 - 14x + 53 = 0$ 1) _____

Answer: {7 – 2i, 7 + 2i}
Objective: (1.5) Solve Quadratic Equations Using the Quadratic Formula
INTERACTMATH SEC 1.5 EXE 73

ALVAREZ VIDEO 8

Solve the radical equation, and check all proposed solutions.

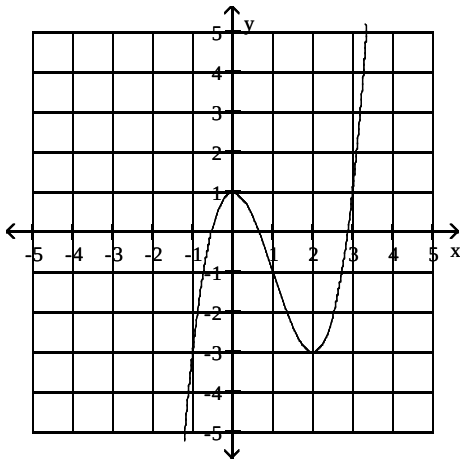
2) $\sqrt{22x + 11} = x + 6$ 2) _____

Answer: {5}
Objective: (1.6) Solve Radical Equations
INTERACTMATH SEC 1.6 EXE 19

ALVAREZ –-VIDEO 9

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

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

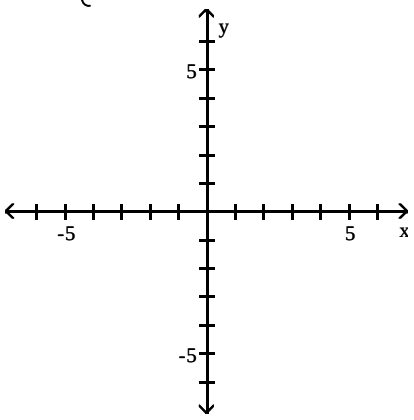


Answer: maximum: (0, 1); minimum: (2, –3)
Objective: (2.2) Use Graphs to Locate Relative Maxima or Minima
INTERACTMATH SEC 2.2 EXE 15

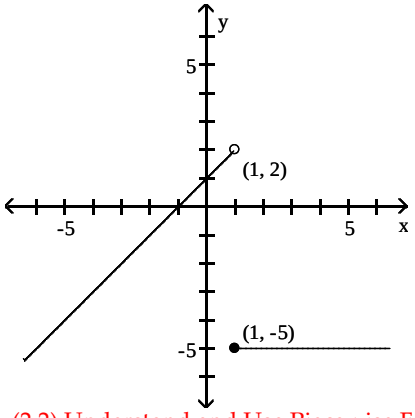
ALVAREZ–-VIDEO 15

Graph the function.

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



Answer:



Objective: (2.2) Understand and Use Piecewise Functions

INTERACTMATH SEC 2.2 EXE 45

ALVAREZ--VIDEO 17

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

5) $f(x) = x^2 + 9x - 2$ 5) _____

Answer: $2x + h + 9$

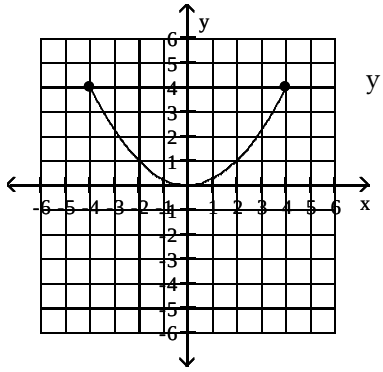
Objective: (2.2) Find and Simplify a Function's Difference Quotient

INTERACTMAT SEC 2.2 EXE 61

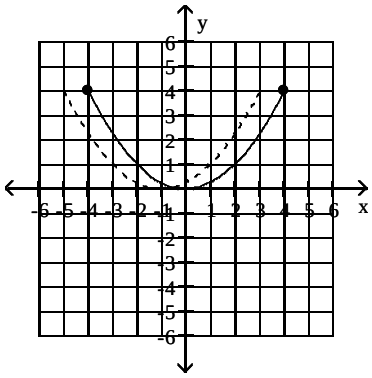
ALVAREZ-- VIDEO 18

Use the graph of the function f, plotted with a solid line, to sketch the graph of the given function g.

6) g(x) = f(x + 1) 6) _____



Answer:



Objective: (2.5) Use Horizontal Shifts to Graph Functions

INTERACTMATH SEC 2.5 EXE 19

ALVAREZ –-VIDEO 22

Find the domain of the function.

7) $f(x) = \sqrt{24 - x}$ 7) _____

Answer: $(-\infty, 24]$

Objective: (2.6) Find the Domain of a Function

INTERACTMATH SEC 2.6 EXE 23

ALVAREZ–-VIDEO 23

Given functions f and g, perform the indicated operations.

8) f(x) = 9x – 2, g(x) = 4x – 7 8) _____

Find f – g.

Answer: 5x + 5

Objective: (2.6) Combine Functions Using the Algebra of Functions, Specifying Domains

INTERACTMATH SEC 2.6 EXE 31

ALVAREZ–-VIDEO 25

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

9) f(x) = 3x + 14, g(x) = 2x – 1 9) _____

$(f \circ g)(x)$

Answer: 6x + 11

Objective: (2.6) Form Composite Functions

INTERACTMATH SEC 2.6 EXE 51

ALVAREZ–-VIDEO 30

10) $f(x) = 4x^2 + 6x + 5, \quad g(x) = 6x - 7$ 10) _____

$(g \circ f)(x)$

Answer: $24x^2 + 36x + 23$

Objective: (2.6) Form Composite Functions

INTERACTMATH SEC 2.6 EXE 53

ALVAREZ--VIDEO 31

Find the distance between the pair of points.

11) (–1, –3) and (–5, 0) 11) _____

Answer: 5

Objective: (2.8) Find the Distance Between Two Points

INTERACTMATH SEC 2.8 EXE 3

ALVAREZ--VIDEO 33

Find the midpoint of the line segment whose end points are given.

12) (5, 1) and (3, 0) 12) _____

Answer: $(4, \frac{1}{2})$

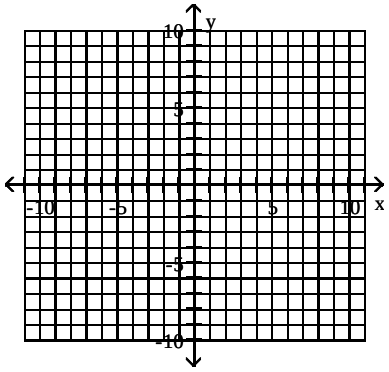
Objective: (2.8) Find the Midpoint of a Line Segment

INTERACTMATH SEC 2.8 EXE 19

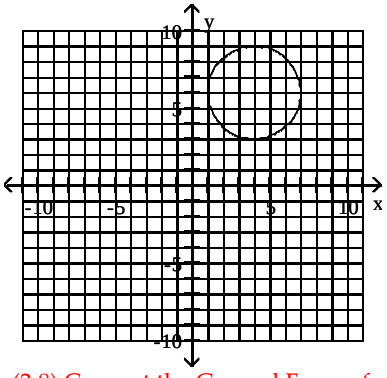
ALVAREZ--VIDEO 35

Graph the equation.

13) $x^2 + y^2 - 8x - 12y + 43 = 0$ 13) _____



Answer:



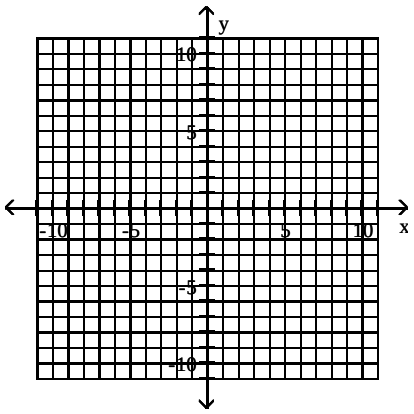
Objective: (2.8) Convert the General Form of a Circle's Equation to Standard Form

INTERACTMATH SEC 2.8 EXE 53

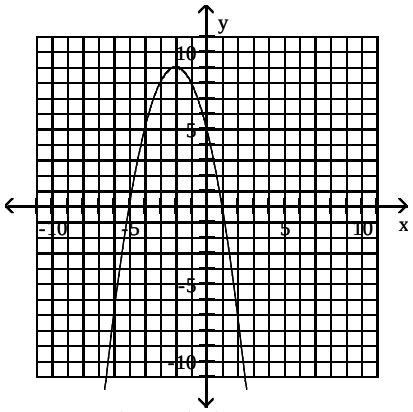
ALVAREZ--VIDEO 36

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

14) $f(x) = -x^2 - 4x + 5$ 14) _____



Answer:



Objective: (3.1) Graph Parabolas
INTERACTMATH SEC 3.1 EXE 3
ALVAREZ--VIDEO 38

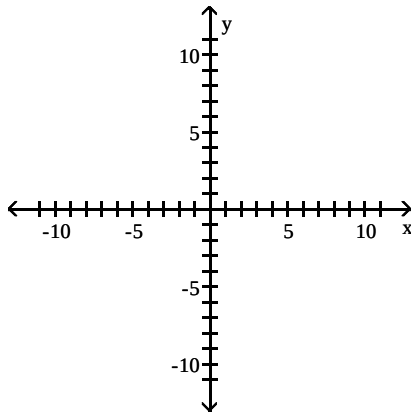
Solve the problem.

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) _____

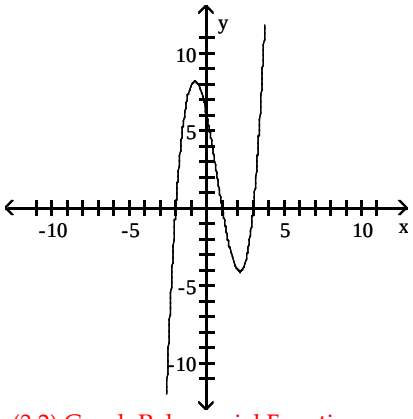
Answer: 400 ft
Objective: (3.1) Solve Problems Involving a Quadratic Function's Minimum or Maximum Value
INTERACTMATH SEC 3.1 EXE 29
ALVAREZ--VIDEO 39

Graph the polynomial function.

16) $f(x) = x^3 - 2x^2 - 5x + 6$ 16) _____



Answer:



Objective: (3.2) Graph Polynomial Functions
INTERACTAMATH SEC 3.2 EXE 15
ALVAREZ--VIDEO 43

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

17) $x^3 + 3x^2 - 4x - 12 = 0$ 17) _____

Answer: {–3, –2, 2}
Objective: (3.4) Solve Polynomial Equations
INTERACTMATH SEC 3.4 EXE 17
ALVAREZ--VIDEO 48

18) $x^3 + 3x^2 - 8x + 10 = 0$ 18) _____

Answer: {1 + i, 1 – i, –5}
Objective: (3.4) Solve Polynomial Equations
INTERACTMATH SEC 3.4 EXE 47
ALVAREZ--VIDEO 49

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

19) $\dfrac{x - 81}{x^2 - 15x + 56}$ 19) _____

Answer: $x = 8, x = 7$
Objective: (3.5) Identify Vertical Asymptotes
INTERACTMATH SEC 3.5 EXE 3
ALVAREZ--VIDEO 54

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

20) $g(x) = \dfrac{4x^2 - 7x - 5}{7x^2 - 3x + 7}$ 20) _____

Answer: $y = \dfrac{4}{7}$

Objective: (3.5) Identify Horizontal Asymptotes
INTERACTMATH SEC 3.5 EXE 35
ALVAREZ--VIDEO 56

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

21) $f(x) = \dfrac{x^2 + 3x - 8}{x - 4}$ 21) _____

Answer: $y = x + 7$
Objective: (3.5) Identify Slant Asymptotes
INTERACTMATH SEC 3.5 EXE 75
ALVAREZ--VIDEO 57

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

22) $\log_a \left(\dfrac{x^4 \sqrt[3]{x + 5}}{(x - 2)^2} \right)$ 22) _____

Answer: $4 \log_a x + \dfrac{1}{3} \log_a (x + 5) - 2 \log_a (x - 2)$

Objective: (4.3) Expand Logarithmic Expressions
INTERACTMATH SEC 4.3 EXE 27
ALVAREZ--VIDEO 66

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

23) $4^{x + 10} = 8^{x - 2}$ 23) _____

Answer: {26}
Objective: (4.4) Use Like Bases to Solve Exponential Equations
INTERACTMATH SEC 4.4 EXE 19
ALVAREZ--VIDEO 70

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) $\log_4 (x - 4) + \log_4 (x - 10) = 2$ 24) _____

Answer: {12}
Objective: (4.4) Use the Definition of a Logarithm to Solve Logarithmic Equations
INTERACTMATH SEC 4.4 EXE 65
ALVAREZ--VIDEO 76

25) $\log x + \log (x - 1) = \log 12$ 25) _____

Answer: {4}
Objective: (4.4) Use the One-to-One Property of Logarithms to Solve Logarithmic Equations
INTERACTMATH SEC 4.4 EXE 85
ALVAERZ--VIDEO 80

Solve the problem.

26) The function $A = A_0e^{-0.0077x}$ 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 800 pounds of the material are placed in the vault, how much time will need to pass for only 504 pounds to remain? 26) _____

Answer: 60 years
Objective: (4.4) Solve Applied Problems Involving Exponential and Logarithmic Equations
INTERACTMATH SEC 4.4 EXE 101
ALVAREZ--VIDEO 83

27) The population of a certain country is growing at a rate of 2.5% 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.) 27) _____

Answer: 28 years
Objective: (4.4) Solve Applied Problems Involving Exponential and Logarithmic Equations
INTERACTMATH SEC 4.4 EXE 101
ALVAREZ--VIDEO 84

Solve the system of equations.

28) $x + y + z = -6$
$x - y + 3z = 2$
$3x + y + z = -14$ 28) _____

Answer: {(−4, −3, 1)}
Objective: (5.2) Solve Systems of Linear Equations in Three Variables
INTERACTMATH SEC 5.4 EXE 7
ALVAREZ–VIDEO 89

Find the indicated sum.

29) $\sum_{i=3}^{5} (i^2 + 2)$ 29) _____

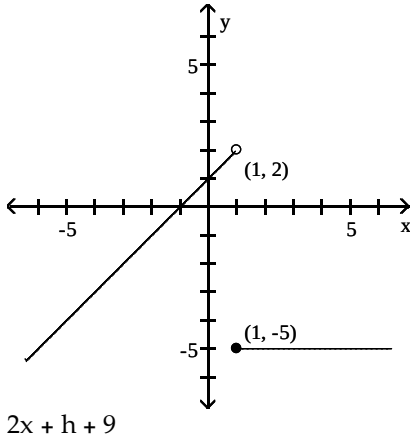
Answer: 56
Objective: (8.1) Use Summation Notation
INTERACTMATH SEC 8.1 EXE 33
ALVAREZ--VIDEO 98

Use the Binomial Theorem to expand the binomial and express the result in simplified form.

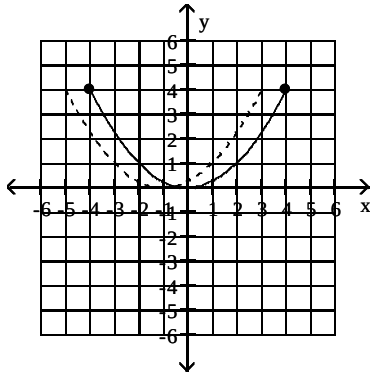
30) $(2x + 3)^3$ 30) _____

Answer: $8x^3 + 36x^2 + 54x + 27$
Objective: (8.5) Expand a Binomial Raised to a Power
INTERACTMATH SEC 8.5 EXE 11
ALVAREZ--VIDEO 99

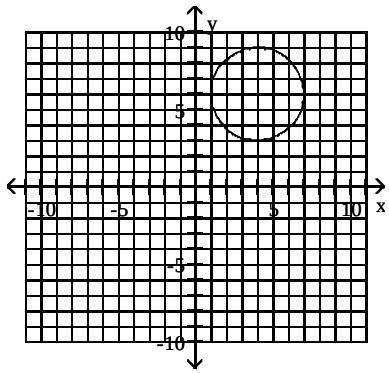
1) {7 – 2i, 7 + 2i}
2) {5}
3) maximum: (0, 1); minimum: (2, –3)
4)



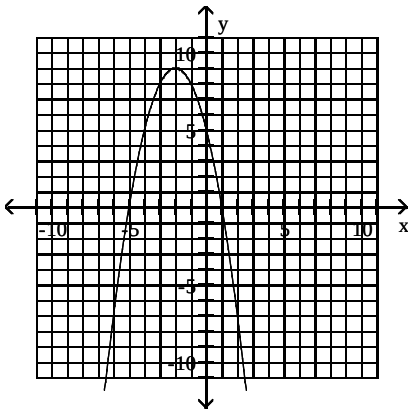
5) 2x + h + 9
6)



7) (–∞, 24]
8) 5x + 5
9) 6x + 11
10) $24x^2 + 36x + 23$
11) 5
12) $(4, \frac{1}{2})$
13)

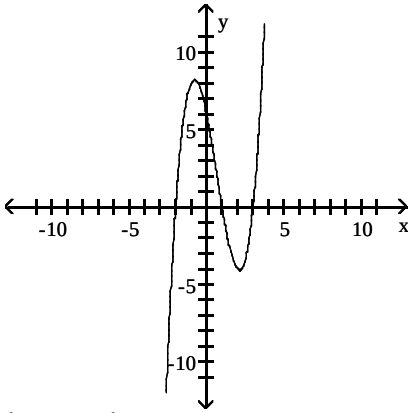


14)



15) 400 ft

16)



17) {–3, –2, 2}

18) {1 + i, 1 – i, –5}

19) x = 8, x = 7

20) $y = \frac{4}{7}$

21) y = x + 7

22) $4 \log_a x + \frac{1}{3} \log_a (x + 5) - 2 \log_a (x - 2)$

23) {26}

24) {12}

25) {4}

26) 60 years

27) 28 years

28) {(–4, –3, 1)}

29) 56

30) $8x^3 + 36x^2 + 54x + 27$