

Test 3

25 QUESTIONS MATH1314 08281700 COLLEGE ALGEBRA SULL067 -35SU 0121919000

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MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the radical equation, and check all proposed solutions.

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

A) $\{-7\}$

B) $\{8\}$

C) $\{-6\}$

D) $\{7\}$

1) _____

Objective: (1.6) Solve Radical Equations

ALVAREZ VIDEO 9 S67-21 SULLIVAN147-49,76 M90-20 M75-20

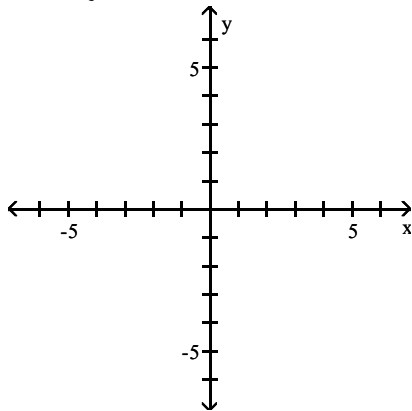
M99-13 M57-11 m49-3 m50-9 m102 #16 m44 #4 m37-5

m51-5

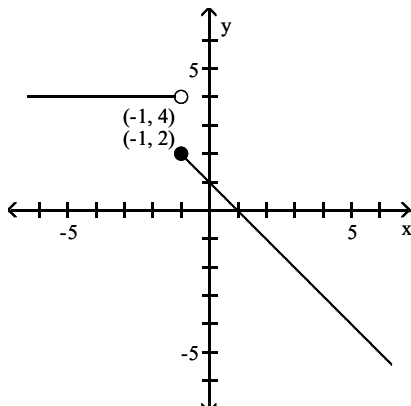
Graph the function.

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

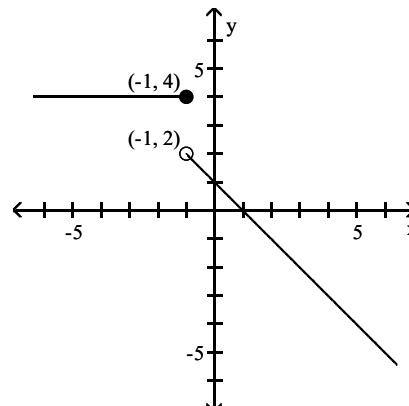
2) _____



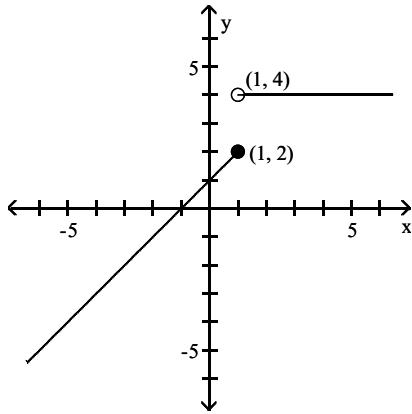
A)



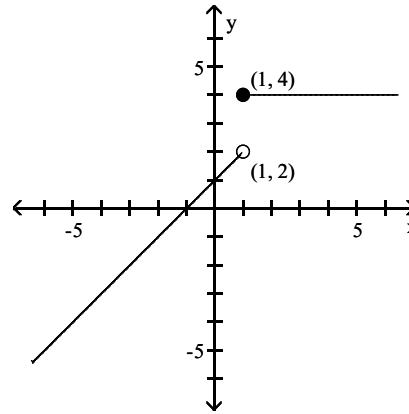
B)



C)



D)



Objective: (2.2) Understand and Use Piecewise Functions

ALVAREZ VIDEO 17 S67-14 SULLIVAN147- 63,64 M90-27
 M75-25 M57-12 m49-6 m50-10
 m102 #24 m44 #5 m37-6 m51-8

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

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

A) $2x + h + 6$

C) $2x + h + 5$

B) $\frac{2x^2 + 2x + 2xh + h^2 + h + 12}{h}$

D) 1

3) _____

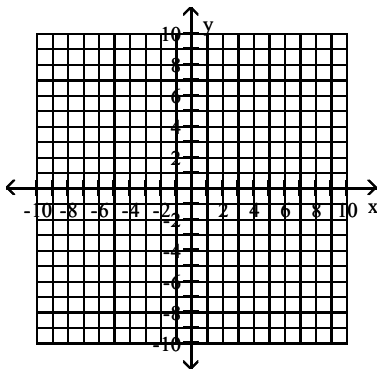
Objective: (2.2) Find and Simplify a Function's Difference Quotient

ALVAREZ VIDEO 18 S67- 9 SULLIVAN147-55 M90-28 M75-26
 M99-23 M57-13 m49-7 m50-11 m102 #25
 m44 #6 m37-7 m51-9

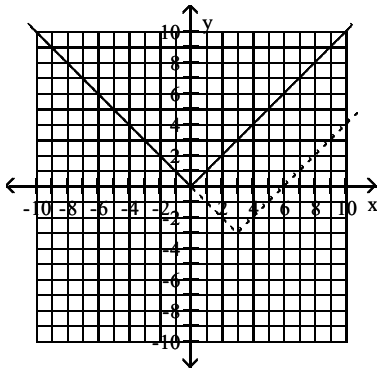
Begin by graphing the standard absolute value function $f(x) = |x|$. Then use transformations of this graph to graph the given function.

4) $h(x) = |x - 3| - 3$

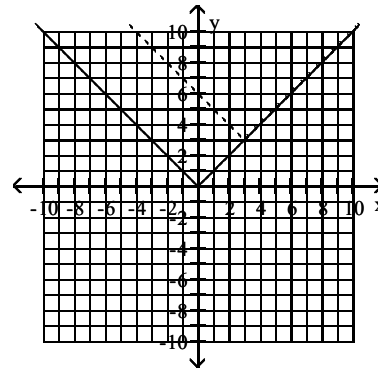
4) _____



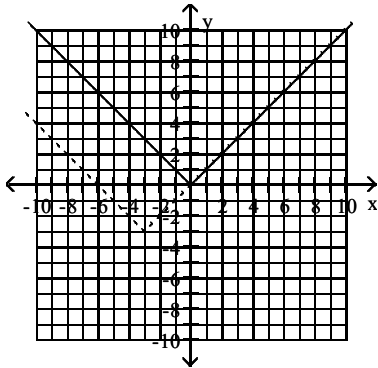
A)



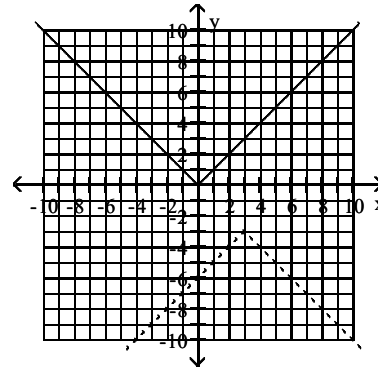
B)



C)



D)



Objective: (2.5) Use Horizontal Shifts to Graph Functions

ALVAREZ VIDEO 21 S67-16 SULLIVAN147-66 M90-36 M75-38
M99-15 M57-20 m49-8 m37-14 m51-19,20

Find the domain of the function.

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

A) $(-\infty, 18) \cup (18, \infty)$

C) $(-\infty, 18]$

B) $(-\infty, 3\sqrt{2}]$

D) $(-\infty, 3\sqrt{2}) \cup (3\sqrt{2}, \infty)$

5) _____

Objective: (2.6) Find the Domain of a Function

ALVAREZ VIDEO 23 S67-6 SULLIVAN147-52 M90-38 M75-28
M99-31,32 M57-14 m49-9 m50-12 m102 #30 m44 #7 m37-8 m51-11

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

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

$(g \circ f)(x)$

A) $12x^2 + 9x + 22$

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

C) $4x^2 + 9x + 14$

D) $4x^2 + 3x + 2$

6) _____

Objective: (2.6) Form Composite Functions

ALVAREZ VIDEO 31 S67-32 SULLIVAN147-108 M90-41 M75-31
M99-35,36,37 M57-16 m49-14 m50-14 m102 #35
m44 #9 m37-10 m51-13

Find the distance between the pair of points.

7) $(-1, -3)$ and $(-7, 5)$

A) 10

B) 20

C) 11

D) 100

7) _____

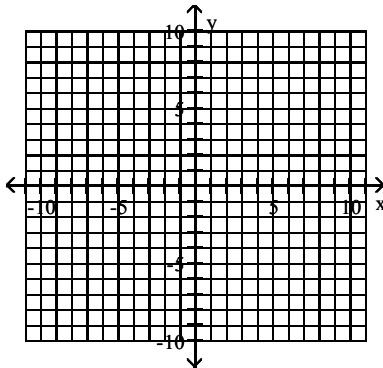
Objective: (2.8) Find the Distance Between Two Points

ALVAREZ VIDEO 33 S67-1 SULLIVAN147-43 M90-43 M75-33 M99-38
M57-17 m49-15 m50-15 m102 #38 m44 #10 m37-11 m51-14

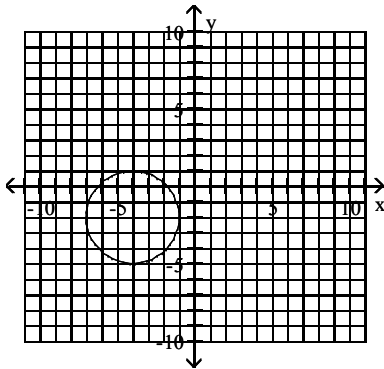
Graph the equation.

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

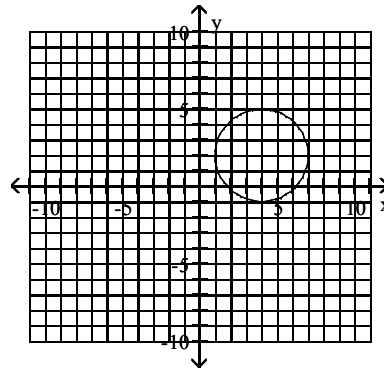
8) _____



A)



B)



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

ALVAREZ VIDEO 36 S67-3 SULLIVAN147-48 M90-45 M75-35
M99-40,41 M57-19 m49-17 m50-17 m102 #41 m44 #12 m37-13 m51-16

Solve the problem.

9) 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.

A) 1200 ft

B) 80 ft

C) 400 ft

D) 720 ft

9) _____

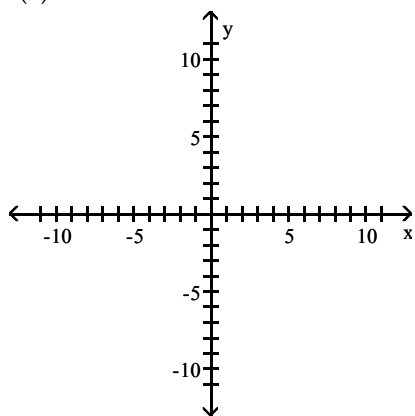
Objective: (3.1) Solve Problems Involving a Quadratic Function's Minimum or Maximum Value

ALVAREZ VIDEO 39 S67-27 SULLIVAN147-94 M90-51 M75-41 M99-43
M57-23 m49-20 m102 #44,45,46 m37-16 m51-17,18

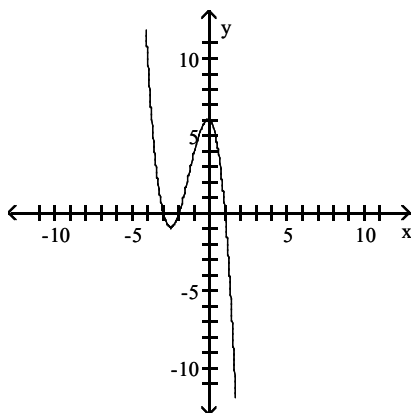
Graph the polynomial function.

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

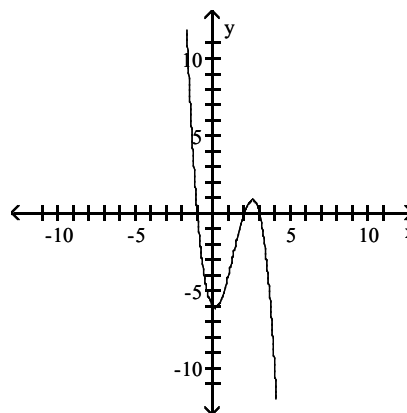
10) _____



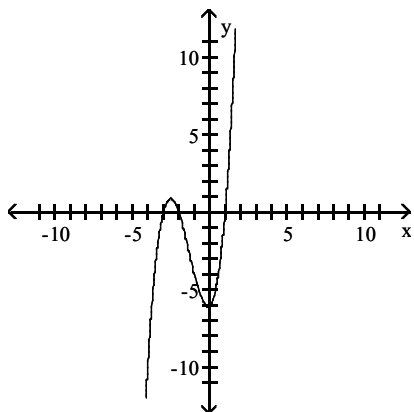
A)



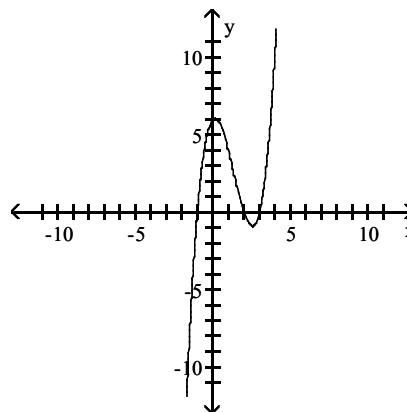
B)



C)



D)



Objective: (3.2) Graph Polynomial Functions

ALVAREZ VIDEO 43 S67-24,25 SULLIVAN147-62 M90-26 M75-24
M99-19 M57-28 m49-22 m50-23 m102 #50 m44 #18 m37-20 m51-7,25

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

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

11) _____

A) $\{-10, 10\}$

B) $\{1 + i, 1 - i, 10i\}$

C) $\{1 + i, 1 - i, 10\}$

D) $\{1 + i, 1 - i, -10\}$

Objective: (3.4) Solve Polynomial Equations

ALVAREZ VIDEO 49 S67-30 SULLIVAN147-99,100,101 M90-55 M75-45
M99-48,49,50,51,53 M57-26 m49-24 m50-22 m102-50 m44-17 m37-17
m51-23,24,25

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

12) $\frac{x - 49}{x^2 - 7x + 10}$

12) _____

- A) $x = 2, x = 5$
C) $x = -49$

- B) $x = -2, x = -5$
D) $x = 2, x = 5, x = -49$

Objective: (3.5) Identify Vertical Asymptotes

**ALVAREZ VIDEO 54 S67-31 SULLIVAN147-103,104 M90-57 M75-47
M99-58,59,60,61 m49-27 m50-26 m102 #56 m44 #21 m37-22 m51-27,28**

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

13) $f(x) = \frac{x^2 + 6x - 5}{x - 4}$

13) _____

- A) $y = x + 6$
C) $y = x + 10$

- B) $y = x$
D) no slant asymptote

Objective: (3.5) Identify Slant Asymptotes

**ALVAREZ VIDEO 57 M90-61 A ONLY M75-51 A ONLY M99-57 M57-30
m49-30 m50-25 m102 #58 m44 #20 m37-21 m51-26**

Find the domain of the logarithmic function.

14) $f(x) = \ln(8 - x)$

14) _____

- A) $(-\infty, 8)$

- B) $(-8, \infty)$

- C) $(-\infty, 0)$

- D) $(-\infty, 8)$ or $(8, \infty)$

Objective: (4.2) Find the Domain of a Logarithmic Function

**ALVAREZ VIDEO 63 S67-39,41,47a SULLIVAN147-118 M90-64
M75-54 M99-66 M57-35 m49-31 m50-30 m102 #61 m44 #24 m37-25
m51-31**

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

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

15) _____

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

- B) $\log 4 + \log x^4 + \log(5-x)^{1/3} - \log 6 - \log(x+5)^2$

- C) $\log(4x^4 \sqrt[3]{5-x}) - \log(6(x+5)^2)$

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

Objective: (4.3) Expand Logarithmic Expressions

**ALVAREZ VIDEO 67 S67-50,51 SULLIVAN147-123,124 M90-66 M75-56
M99-67,68,69,70 M57-36-37 m49-32 m50-31,32 m102-62,63,64 m44-25,26
#62,63,64 m44 25,26 m37-26,27 m51-32,33**

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

16) $16^x + 7 = 64^x - 10$ 16) _____
A) {24} B) {44} C) {37} D) {17}

Objective: (4.4) Use Like Bases to Solve Exponential Equations

**ALVAREZ VIDEO 70 S67-34 SULLIVAN147-113 M90-67 M75-57
M99-73 M57-38 m49-33 m50-33 m102 #65 m44 #27 m37-28 m51-34**

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

17) $3^{x+6} = 8$ 17) _____
A) -4.11 B) 6.53 C) 1.31 D) -0.35

Objective: (4.4) Use Logarithms to Solve Exponential Equations

**ALVAREZ VIDEO 73 S67-46,56 SULLIVAN147-130,131,132 M90-69
M75-59 M99-77 M57-39 M50-34 m37-29 m51-36**

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.

18) $\log_4(x-1) + \log_4(x-7) = 2$ 18) _____
A) {9, -1} B) {9} C) {10} D) {-1}

Objective: (4.4) Use the Definition of a Logarithm to Solve Logarithmic Equations

**ALVAREZ VIDEO 76 S67-53 SULLIVAN147-127,129 M90-72 M75-62
M99-78 M57-40 M49-37 M50-35 M102 #75 M44 #30 m37-30 m51-38**

19) $\log(4+x) - \log(x-4) = \log 3$ 19) _____
A) {8} B) $\left\{\frac{3}{2}\right\}$ C) {-8} D) \emptyset

Objective: (4.4) Use the One-to-One Property of Logarithms to Solve Logarithmic Equations

**ALVAREZ VIDEO 79 S67-54 SULLIVAN147-128 M90-73 M75-63
M99-80 M57-42 M50-37 m37-32 m51-40**

20) $\ln x + \ln(x-1) = \ln 72$ 20) _____
A) {9, -8} B) {-8} C) $\left\{\frac{73}{2}\right\}$ D) {9}

Objective: (4.4) Use the One-to-One Property of Logarithms to Solve Logarithmic Equations

ALVAREZLAB EXPONENZ (3,4) INTERACTMATH SEC 4.4 EXE 85

**ALVAERZ VIDEO 80 S67-55 SULLIVAN147-127,129 M90-76 M75-65
M99-79,81 M57-43 m49-40,41 m50-36,37,38
m102 #81 m44 #32 m37-33 m51-41**

Solve the problem.

21) 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 $A = P\left(1 + \frac{r}{n}\right)^{nt}$. 21) _____
A) 8.8 years B) 9 years C) 8.6 years D) 9.2 years

Objective: (4.4) Solve Applied Problems Involving Exponential and Logarithmic Equations

**ALVAREZ VIDEO 81 S67-59 SULLIVAN35-29 M90-77 M75-66 M99-84
M57-44 M50-39 m37-34 m51-43**

Answer Key

Testname: AAFM1314SULL067T3SU

- 1) D
- 2) D
- 3) C
- 4) A
- 5) C
- 6) B
- 7) A
- 8) B
- 9) C
- 10) C
- 11) D
- 12) A
- 13) C
- 14) A
- 15) D
- 16) B
- 17) A
- 18) B
- 19) A
- 20) D
- 21) A
- 22) A
- 23) B
- 24) B
- 25) B