

Solve.

1) $|4x + 2| + 7 < 16$

1) _____

A) $\left(-\infty, -\frac{11}{4}\right) \cup \left(\frac{7}{4}, \infty\right)$

B) $\left[-\frac{11}{4}, \frac{7}{4}\right]$

C) $\left(-\infty, -\frac{11}{4}\right]$

D) $\emptyset$

Solve the problem.

- 2) The owner of a video store has determined that the profits P of the store are approximately given by $P(x) = -x^2 + 50x + 53$, where x is the number of videos rented daily. Find the maximum profit to the nearest dollar.

2) _____

A) \$678

B) \$1250

C) \$625

D) \$1303

Solve the equation.

3) $2^1 + 2^x = 8$

3) _____

A) $\{-1\}$

B) $\{1\}$

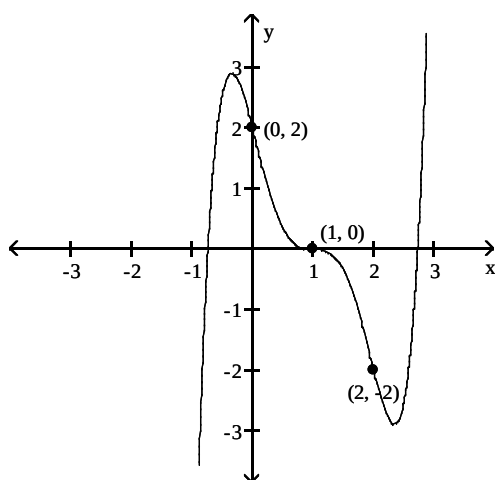
C) $\{4\}$

D) $\{2\}$

Evaluate as requested.

4) A graph of a function f is shown below. Find $f(0)$.

4) _____



A) 1

B) 2

C) -2

D) -1

Find the slope of the line that is PERPENDICULAR to the line containing the given points.

5) $(-18, -3)$ and $(-7, 9)$

5) _____

A) $\frac{-11}{12}$

B) $\frac{12}{11}$

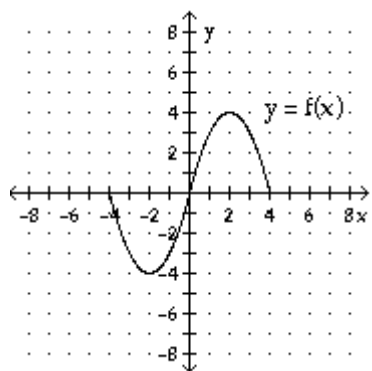
C) $\frac{-11}{4}$

D) $-\frac{6}{25}$

E) $-\frac{12}{11}$

The graph of the function f is shown below. Match the function g with the correct graph.

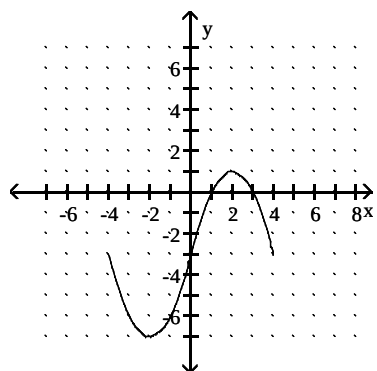
6)



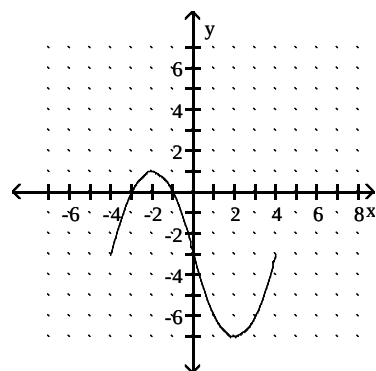
6) _____

$$g(x) = f(-x) + 3$$

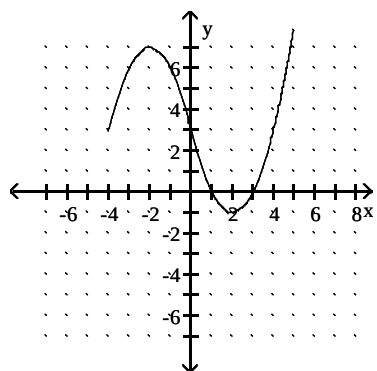
A)



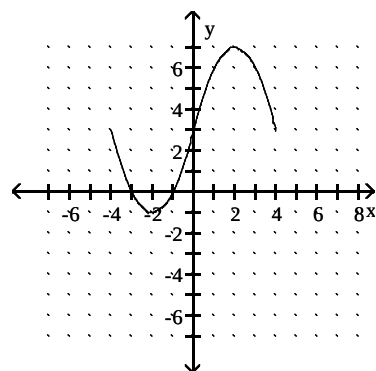
B)



C)



D)



Solve.

7) $-\frac{7}{8}x \leq \frac{5}{6} + \frac{11}{4}x$

7) _____

A) $(-\infty, -\frac{20}{87}]$

B) $[-\frac{20}{87}, \infty)$

C) $[\frac{20}{87}, \infty)$

D) $(-\infty, \frac{20}{87}]$

Find the quotient and the remainder by any method including synthetic division.

8) $(2x^5 - x^4 + 3x^2 - x + 5) \div (x - 1)$

8) _____

A) $Q(x) = (2x^4 + x^3 + x^2 + 4x + 3); R(x) = 8$

B) $Q(x) = (2x^4 - 3x^3 - x); R(x) = 6$

C) $Q(x) = (2x^4 + x^3 - x^2 + 2x + 1); R(x) = 6$

D) $Q(x) = (2x^4 + x^3 + 4x^2 + 3x); R(x) = 8$

Given that the polynomial function has the given zero, find the other zeros.

9) $f(x) = x^3 - 3x^2 - 5x + 39$; -3

A) $1 + 2i, 1 - 2i$

C) $3 + 2i, 3 - 2i$

B) $1 + 2\sqrt{13}i, 1 - 2\sqrt{13}i$

D) $3 + 4i, 3 - 4i$

9) _____

Give all possible rational zeros for the polynomial.

10) $P(x) = 3x^3 + 60x^2 + 60x + 27$

A) $\pm 1, \pm 1/3, \pm 3, \pm 9, \pm 27$

C) $\pm 1, \pm 1/3, \pm 1/9, \pm 1/27, \pm 3$

B) $\pm 1, \pm 3, \pm 9, \pm 27$

D) $\pm 1, \pm 3, \pm 6, \pm 9, \pm 27$

10) _____

Find the indicated composite function.

11) Given $f(x) = 4x^2 + 5x + 6$ and $g(x) = 5x - 3$, find $(g \circ f)(x)$.

A) $20x^2 + 25x + 27$

B) $20x^2 + 25x + 33$

C) $4x^2 + 5x + 3$

D) $4x^2 + 25x + 27$

11) _____

Find the inverse of the function.

12) $f(x) = \sqrt[3]{x} - 1$

A) $f^{-1}(x) = (x - 1)^3$

B) $f^{-1}(x) = x^3 + 1$

C) $f^{-1}(x) = (x + 1)^3$

D) $f^{-1}(x) = \sqrt[3]{x} + 1$

12) _____

Solve the problem.

- 13) Suppose the amount of a radioactive element remaining in a sample of 100 milligrams after x years can be described by $A(x) = 100e^{-0.0161x}$. How much is remaining after 81 years? Round the answer to the nearest hundredth of a milligram. 13) _____

- A) 130.41 milligrams
- B) 43.67 milligrams
- C) 0.27 milligrams
- D) 368.44 milligrams
- E) 27.14 milligrams

Convert to an exponential equation.

- 14) $\log_{0.85} M = x$ 14) _____
- A) $0.85^M = x$ B) $M^{0.85} = x$ C) $x^{0.85} = M$ D) $0.85^x = M$

Find the logarithm using the change-of-base formula.

- 15) $\log_7 0.124$ 15) _____
- A) -1.0727 B) -0.9322 C) 56.4516 D) -0.9066 E) 0.7288

Solve the logarithmic equation.

16) $\log(4 + x) - \log(x - 5) = \log 2$

A) $\frac{-3}{2}$

B) -14

C) $\emptyset$

D) $\frac{3}{2}$

E) 14

16) _____

Tell whether or not the relation is a function.

17) Which of the following relations is a one-to-one function?

A) $\{(3,5), (5,3), (6,8), (8,6), (0,0)\}$

B) $\{(-2,7), (3,-7), (6,8), (7,2), (3,-9)\}$

C) $\{(-2,7), (3,-9), (6,8), (7,2), (5,-9)\}$

17) _____

Determine if the function is even, odd, or neither.

18) $f(x) = -8x^5 + 9x^3 + 1$

A) Even

B) Odd

C) Neither

18) _____

Find the horizontal asymptote of the given function.

19) $h(x) = \frac{5x^2 - 5x - 3}{9x^2 - 6x + 2}$

19) _____

A) $y = 5/6$

B) None

C) $y = 5/9$

D) $y = 0$

Solve the rational equation symbolically, numerically, or graphically.

20) $\frac{2}{x} = \frac{x}{5x - 12}$

Find the sum of the solutions.

20) _____

A) 12

B) 10

C) 0

D) 36

E) 24

Determine the equation of the line described. Put answer in the slope-intercept form, if possible.

21) Through $(-5, 2)$, parallel to $y = \frac{2}{3}x - \frac{13}{3}$ Find the value for b in $y = mx + b$.

21) _____

A) $-\frac{13}{2}$

B) $\frac{13}{3}$

C) $\frac{16}{3}$

D) -19

Solve the quadratic equation.

22) $2x^2 + 6x = -3$

A) $\frac{-3 \pm \sqrt{15}}{2}$

B) $\frac{-3 \pm \sqrt{3}}{2}$

C) $\frac{-6 \pm \sqrt{3}}{2}$

D) $\frac{-3 \pm \sqrt{3}}{4}$

22) _____

Find the domain of f.

23) $f(x) = \frac{x - 5}{x^2 + 3x}$

A) $\{x \mid x \neq 0, x \neq -3\}$

C) $\{x \mid x \neq 3\}$

B) $\{x \mid x \neq -3\}$

D) $\{x \mid x \neq 5\}$

23) _____

Solve the system of linear equations.

24) $2x + y = 9$

$6x + 3y = 27$

A) (0, 9)

C) (5, -1)

B) Infinitely many solutions

D) No solutions

24) _____

Find the value of the expression.

25) Let $\log_b A = 5$ and $\log_b B = -25$. Find $\log_b (AB)$

25) _____

A) $\frac{1}{5}$

B) -125

C) $-\frac{1}{5}$

D) 0

E) -20

Write the equation of the line.

26) Vertical, through $(-2, 2)$

26) _____

A) $x = 2$

B) $y = 2$

C) $y = -2$

D) $x = -2$

Solve this equation.

27) $\sqrt{x+7} + 5 = x$ Find all real and extraneous solutions (if any).

27) _____

A) Real $\{9\}$ and Extraneous $\{2\}$

B) Real $\{2\}$ and Extraneous ϕ

C) Real $\{2\}$ and Extraneous $\{9\}$

D) Real ϕ and Extraneous $\{2\}$

E) Real $\{9\}$ and Extraneous $\{18\}$

Answer Key

Testname: 1314 - DEPT FINAL - FORM 1

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