MATH 1314 – Final Exam – FORM 2 Name _____

Write the equation of the line.

1) Vertical, through (–4, 3) 1) _____

A) $x = 3$ B) $y = 3$ C) $y = -4$ D) $x = -4$

Solve.

2) $-\frac{5}{6}x \le \frac{3}{4} + \frac{10}{3}x$ 2) _____

A) $(-\infty, -\frac{9}{50}]$ B) $[-\frac{9}{50}, \infty)$ C) $[\frac{9}{50}, \infty)$ D) $(-\infty, \frac{9}{50}]$

Solve the equation.

3) $2^{1 + 2x} = 32$ 3) _____

A) {–2} B) {2} C) {16} D) {4}

Solve the rational equation symbolically, numerically, or graphically.

4) $\frac{2}{x} = \frac{x}{5x - 12}$ Find the sum of the solutions. 4) _____

A) 12 B) 10 C) 0 D) 36 E) 24

Solve the problem.

5) Suppose the amount of a radioactive element remaining in a sample of 100 milligrams after x years can be described by $A(x) = 100e^{-0.01847x}$. How much is remaining after 91 years? Round the answer to the nearest hundredth of a milligram. 5) _____

A) 168.08 milligrams
B) 43.67 milligrams
C) 0.19 milligrams
D) 536.97 milligrams
E) 18.62 milligrams

Solve.

6) $|6x - 8| + 5 < 8$ 6) _____

A) $\left(-\infty, \frac{5}{6}\right) \cup \left(\frac{11}{6}, \infty\right)$

B) $\left(\frac{5}{6}, \frac{11}{6}\right)$

C) $\left\{-\infty, \frac{5}{6}\right\}$

D) $\emptyset$

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

7) $f(x) = x^3 - 2x^2 - 11x + 52;\ -4$ 7) _____

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

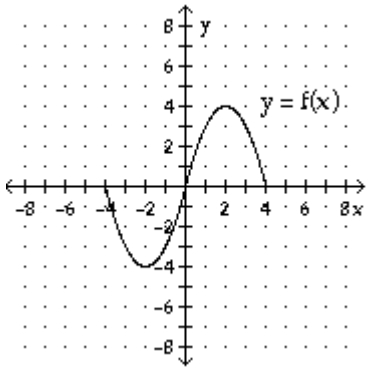
B) $1 + 2\sqrt{13}i, 1 - 2\sqrt{13}i$

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

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

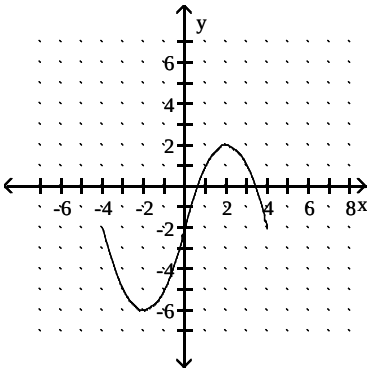
The graph of the function f is shown below. Match the function g with the correct graph.

8) 8) _____

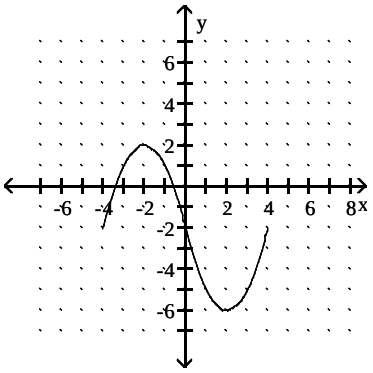


$g(x) = f(-x) + 2$

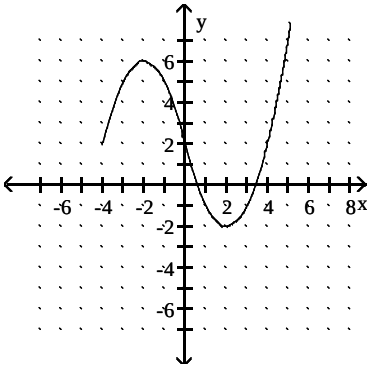
A)



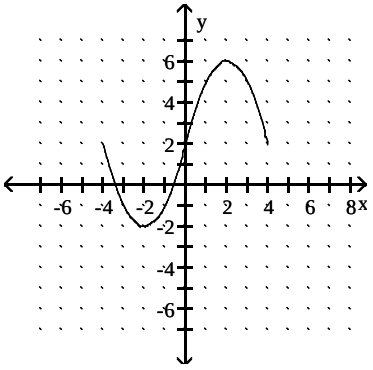
B)



C)



D)



Find the inverse of the function.

9) $f(x) = \sqrt[3]{x} - 4$ 9) _____

A) $f^{-1}(x) = (x - 4)^3$ B) $f^{-1}(x) = x^3 + 4$ C) $f^{-1}(x) = (x + 4)^3$ D) $f^{-1}(x) = \sqrt[3]{x} + 4$

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

10) $\log_7 0.651$ 10) _____

A) –0.2206 B) –4.5333 C) 10.7527 D) –0.1864 E) 0.7288

Find the value of the expression.

11) Let $\log_b A = 3$ and $\log_b B = -12$. Find $\log_b (AB)$ 11) _____

A) $\frac{1}{4}$ B) –125 C) $-\frac{1}{4}$ D) 0 E) –9

Find the horizontal asymptote of the given function.

12) $h(x) = \frac{8x^2 - 7x - 3}{9x^2 - 4x + 5}$ 12) _____

A) y = 7/4 B) None C) y = 8/9 D) y = 0

Solve this equation.

13) $\sqrt{x + 7} + 5 = x$ Find all real and extraneous solutions (if any). 13) _____

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}

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

14) $f(x) = -4x^5 + 3x^3 + 1$ 14) _____

A) Even B) Odd C) Neither

Solve the system of linear equations.

15) $4x + y = 19$ 15) _____
$16x + 4y = 76$

A) (0, 19)
B) Infinitely many solutions
C) (5, –1)
D) No solutions

Find the indicated composite function.

16) Given $f(x) = 4x^2 + 6x + 8$ and $g(x) = 6x - 5$, find $(g \circ f)(x)$. 16) _____

A) $24x^2 + 36x + 43$ B) $24x^2 + 36x + 53$ C) $4x^2 + 6x + 3$ D) $4x^2 + 36x + 43$

Solve the logarithmic equation.

17) $\log(2 + x) - \log(x - 5) = \log 2$ 17) _____

A) $\frac{-3}{2}$ B) – 12 C) $\emptyset$ D) $\frac{5}{2}$ E) 12

Give all possible rational zeros for the polynomial.

18) $P(x) = 3x^3 + 66x^2 + 66x + 27$ 18) _____

A) ±1, ±1/3, ±3, ±9, ±27
B) ±1, ±3, ±9, ±27
C) ±1, ±1/3, ±1/9, ±1/27, ±3
D) ±1, ±3, ±6, ±9, ±27

Convert to an exponential equation.

19) $\log_{0.58} M = x$ 19) _____

A) $0.58^M = x$
B) $M^{0.58} = x$
C) $x^{0.58} = M$
D) $0.58^x = M$

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

20) $(2x^5 - x^4 + 3x^2 - x + 5) \div (x - 1)$ 20) _____

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

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

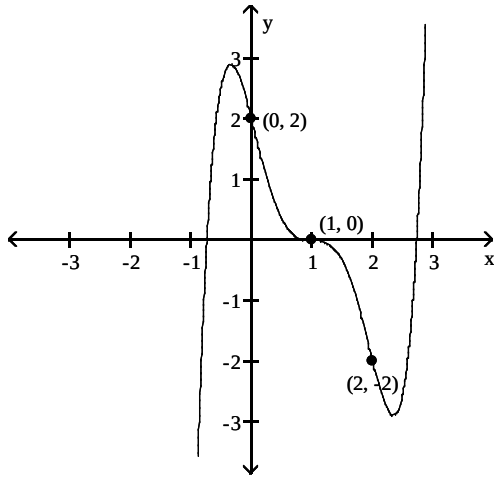
Find the slope of the line that is PERPENDICULAR to the line containing the given points.

22) (7, 18) and (–2, 2) 22) _____

A) $\frac{-9}{16}$ B) $\frac{16}{9}$ C) $\frac{-11}{4}$ D) 4 E) $-\frac{16}{9}$

Evaluate as requested.

23) A graph of a function f is shown below. Find f(2). 23) _____



A) 1 B) –2 C) –1 D) 2

Find the domain of f.

24) $f(x) = \dfrac{x - 9}{x^2 + 4x}$ 24) _____

A) {x | x ≠ 0, x ≠ –4} B) {x | x ≠ –4}

C) {x | x ≠ 4} D) {x | x ≠ 9}

Solve the quadratic equation.

25) $5x^2 + 12x = -3$ 25) _____

A) $\frac{-6 \pm \sqrt{51}}{5}$ B) $\frac{-6 \pm \sqrt{21}}{5}$ C) $\frac{-12 \pm \sqrt{21}}{5}$ D) $\frac{-6 \pm \sqrt{21}}{10}$

Tell whether or not the relation is a function.

26) Which of the following relations is a one–to–one function? 26) _____

A) {(3,5), (5,3), (4,4), (8,6), (0,0)}

B) {(–2,–5), (2,4), (4,4), (8,7), (3,–7)}

C) {(–2,–5), (2,–9), (4,4), (8,7), (5,–7)}

Solve the problem.

27) The owner of a video store has determined that the profits P of the store are approximately given by $P(x) = -x^2 + 30x + 67$, where x is the number of videos rented daily. Find the maximum profit to the nearest dollar. 27) _____

A) $292 B) $450 C) $225 D) $517

Answer Key
Testname: 1314 - DEPT FINAL - FORM 2

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