

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

Find the domain and range of the function.

1) $f(x) = x^2 + 4$

A) Domain: $(-\infty, \infty)$; range: $(-4, \infty)$

C) Domain: $(4, \infty)$; range: $(-\infty, \infty)$

B) Domain: $(-\infty, \infty)$; range: $[4, \infty)$

D) Domain: $(-4, \infty)$; range: $(-\infty, \infty)$

1) _____

Find the equation of the axis of symmetry of the parabola.

2) $f(x) = (x - 1)^2 - 1$

A) $x = -1$

B) $y = -1$

C) $y = 0$

D) $x = 1$

2) _____

3) $y = x^2 - 8x + 18$

A) $x = 4$

B) $x = -4$

C) $x = 2$

D) $x = 0$

3) _____

Find the y-intercepts and any x-intercepts.

4) $y = x^2 - 4x - 32$

A) y-intercept $(0, -32)$, x-intercepts $(8, 0)$ and $(-4, 0)$

B) y-intercept $(0, 32)$, x-intercepts $(8, 0)$ and $(-4, 0)$

C) y-intercept $(-32, 0)$, x-intercepts $(0, 8)$ and $(0, -4)$

D) y-intercept $(0, -32)$, x-intercepts $(-8, 0)$ and $(4, 0)$

4) _____

Identify the vertex of the parabola.

5) $y = 4x^2 - 24x + 38$

A) $(-3, -2)$

B) $(-2, -3)$

C) $(3, 2)$

D) $(2, 3)$

5) _____

Use synthetic division to perform the division.

6) $\frac{x^3 - x^2 + 7}{x + 2}$

A) $x^2 - 3x + 6 + \frac{6}{x + 2}$

B) $x^2 - 3x + 6 + \frac{-5}{x + 2}$

C) $x^2 + 3x + 6 + \frac{-5}{x + 2}$

D) $x^2 - 2x + 6 + \frac{6}{x + 2}$

6) _____

Express the polynomial in the form $P(x) = (x - k)Q(x) + r$ for the given value of k.

7) $P(x) = 3x^3 - x^2 + 2x + 7$; $k = -1$

A) $P(x) = (x - 1) \cdot (3x^2 + 2x) + 7$

B) $P(x) = (x + 1) \cdot (3x^2 + 2x) + 7$

C) $P(x) = (x + 1) \cdot (3x^2 - 4x + 6) + 1$

D) $P(x) = (x + 1) \cdot (3x^2 - 4x + 2) + 9$

7) _____

Use the remainder theorem and synthetic division to find $f(k)$.

8) $k = -3$; $f(x) = 3x^3 - 4x^2 - 4x + 2$

A) -15

B) -59

C) -103

D) -127

8) _____

9) $k = 4 - 3i$; $f(x) = x^2 - 5x + 3$

A) -19

B) $-13 + 3i$

C) $-10 + 3i$

D) $-10 - 9i$

9) _____

- 10) $k = 4 + 2i$; $f(x) = x^2 + 5x - 4$ 10) _____
 A) $32 + 18i$ B) $28 + 26i$ C) $28 + 18i$ D) 54

Use synthetic division to decide whether the given number is a zero of the given polynomial.

- 11) -2 ; $f(x) = -2x^3 + 8x^2 + x - 46$ 11) _____
 A) No B) Yes
- 12) 3 ; $f(x) = 5x^3 + x^2 + 3x - 6$ 12) _____
 A) No B) Yes

Use the factor theorem to decide whether or not the second polynomial is a factor of the first.

- 13) $5x^2 - 27x + 34$; $x - 2$ 13) _____
 A) Yes B) No
- 14) $7x^4 + 29x^3 - 4x^2 + x + 4$; $x + 4$ 14) _____
 A) Yes B) No

Factor $f(x)$ into linear factors given that k is a zero of $f(x)$.

- 15) $f(x) = 2x^3 - 3x^2 - 5x + 6$; $k = 1$ 15) _____
 A) $(x + 1)(x + 2)(2x - 3)$ B) $(x - 1)(x + 1)(2x - 6)$
 C) $(x - 1)(x + 2)(2x - 3)$ D) $(x - 1)(x - 2)(2x + 3)$

For the polynomial, one zero is given. Find all others.

- 16) $P(x) = x^3 - 8x^2 + 17x - 30$; 6 16) _____
 A) $1 + \sqrt{5}$, $1 - \sqrt{5}$ B) $1 + \sqrt{5}i$, $1 - \sqrt{5}i$ C) $1 + 2i$, $1 - 2i$ D) $-1 + 2i$, $-1 - 2i$

Give all possible rational zeros for the following polynomial.

- 17) $P(x) = 2x^3 + 9x^2 + 14x - 8$ 17) _____
 A) ± 1 , $\pm 1/2$, $\pm 1/4$, $\pm 1/8$, ± 2 B) ± 1 , $\pm 1/2$, ± 2 , ± 4 , ± 8
 C) ± 1 , ± 2 , ± 4 D) ± 1 , ± 2 , ± 4 , ± 8

Find the zeros of the polynomial function and state the multiplicity of each.

- 18) $f(x) = -4x^2(x - 9)(x + 1)^3$ 18) _____
 A) -1 , multiplicity 3; 9 , multiplicity 1
 B) -1 , multiplicity 1; 1 , multiplicity 1; 9 , multiplicity 1
 C) -1 , multiplicity 3; 0 , multiplicity 2; 1 , multiplicity 1; 9 , multiplicity 1
 D) -1 , multiplicity 3; 0 , multiplicity 2; 9 , multiplicity 1

Find a polynomial of lowest degree with only real coefficients and having the given zeros.

- 19) $5 + 2i$ and $5 - 2i$ 19) _____
 A) $x^2 + 29$ B) $x^2 - 10x + 21$ C) $x^2 - 10x + 29$ D) $x^2 + 10x + 29$

Use Descartes' Rule of Signs to determine the possible number of positive real zeros and the possible number of negative real zeros for the function.

20) $-2x^4 - 2x^3 - 6x^2 - 3x + 2 = 0$

A) Positive (1), negative (2)

C) Positive (2, 0), negative (2, 0)

B) Positive (1), negative (3, 1)

D) Positive (1), negative (1)

20) _____

21) $5x^3 - 6x^2 + 3x + 5 = 0$

A) Positive (1, 0), negative (1, 0)

C) Positive (1, 0), negative (2)

B) Positive (0), negative (2, 1)

D) Positive (2, 0), negative (1)

21) _____

Give all possible rational zeros for the following polynomial.

22) $P(x) = 2x^3 + 5x^2 + 9x - 8$

A) $\pm 1, \pm 2, \pm 4$

C) $\pm 1, \pm 1/2, \pm 1/4, \pm 1/8, \pm 2$

B) $\pm 1, \pm 2, \pm 4, \pm 8$

D) $\pm 1, \pm 1/2, \pm 2, \pm 4, \pm 8$

22) _____

Find any vertical asymptotes.

23) $f(x) = \frac{7x + 5}{5x - 1}$

A) $x = 5$

B) $x = -5$

C) $x = \frac{7}{5}$

D) $x = \frac{1}{5}$

23) _____

24) $h(x) = \frac{4x - 1}{x^2 + 6x - 7}$

A) $y = 4$

B) $y = 1, y = -7$

C) $x = 1, x = -7$

D) $x = -1, x = 7$

24) _____

Find the horizontal asymptote of the given function.

25) $g(x) = \frac{x^2 + 8x - 9}{x - 9}$

A) $y = 8$

B) None

C) $y = -9$

D) $y = 0$

25) _____

26) $h(x) = \frac{5x^2 - 9x - 2}{9x^2 - 4x + 8}$

A) $y = 5/9$

B) $y = 9/4$

C) None

D) $y = 0$

26) _____

Give the equation of the oblique asymptote, if any.

27) $h(x) = \frac{5}{x - 9}$

A) $y = 9$

B) $x = -9$

C) $y = x - 9$

D) None

27) _____

28) $f(x) = \frac{x^2 - 7x + 4}{x + 3}$

A) $x = y + 7$

B) None

C) $y = x + 11$

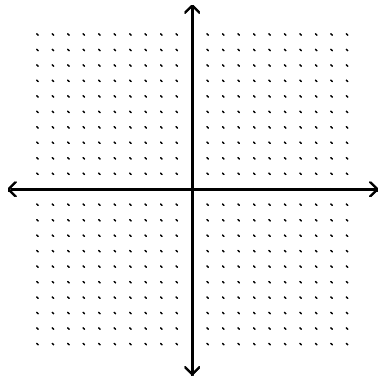
D) $y = x - 10$

28) _____

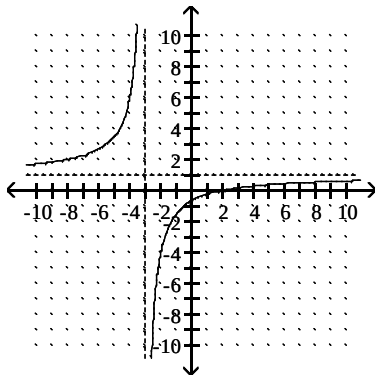
Sketch the graph of the rational function.

29) $f(x) = \frac{x-2}{x+3}$

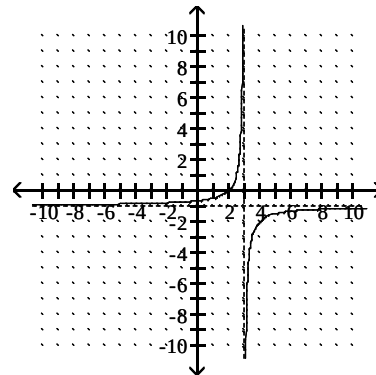
29) _____



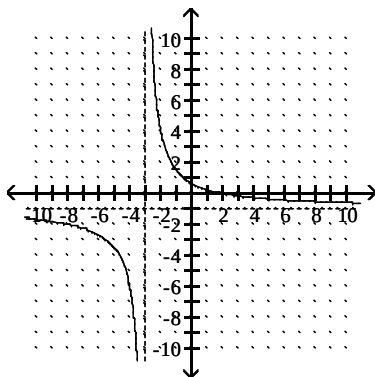
A)



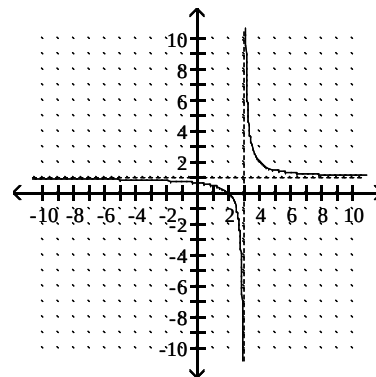
B)



C)



D)



Solve the problem.

30) If m varies directly as p , and $m = 21$ when $p = 7$, find m when p is 4.

30) _____

A) 16

B) 12

C) 49

D) 9

31) The time it takes to complete a certain job varies inversely to the number of people working on that job. If it takes 32 hours for 7 carpenters to frame a house, then how long will it take 56 carpenters to do the same job?

31) _____

A) 40 hours

B) 12.3 hours

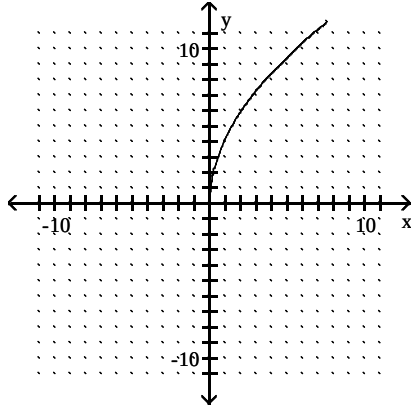
C) 4.0 hours

D) 56 hours

Determine whether or not the function is one-to-one.

32)

32) _____



A) No

B) Yes

Determine whether or not the function is one-to-one.

33) $f(x) = x^2 + 6$

33) _____

A) Yes

B) No

34) $f(x) = 5x^3 - 2$

34) _____

A) No

B) Yes

If the following defines a one-to-one function, find its inverse. If not, write "Not one-to-one."

35) $\{(-2, 4), (2, -4), (8, -2), (-8, 2)\}$

35) _____

A) $\{(4, -2), (-4, 2), (8, -2), (2, -8)\}$

B) $\{(4, -2), (-4, 2), (-2, 8), (2, -8)\}$

C) Not one-to-one

D) $\{(4, -2), (-4, 2), (-2, -8), (2, 8)\}$

36) $\{(-6, -7), (-5, -7), (-4, -1), (-3, 3)\}$

36) _____

A) Not one-to-one

B) $\{(-6, 3), (-6, -1), (-4, -5)\}$

C) $\{(-7, -6), (3, -1), (-4, -5)\}$

D) $\{(-7, -6), (-5, -1), (-4, 3)\}$

Find the function value. If the result is irrational, round your answer to the nearest thousandth.

37) Let $f(x) = 4^x$. Find $f(-3)$.

37) _____

A) $\frac{1}{64}$

B) -12

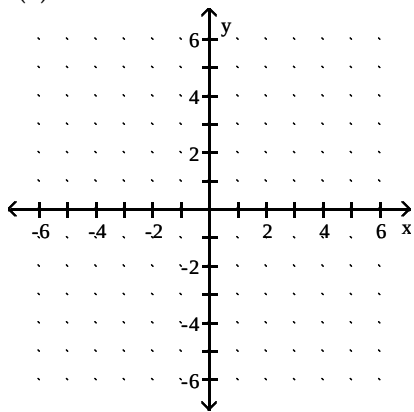
C) $-\frac{1}{12}$

D) $\frac{1}{81}$

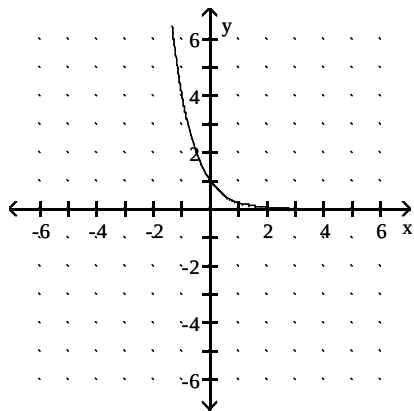
Graph the function.

38) $f(x) = 4^x$

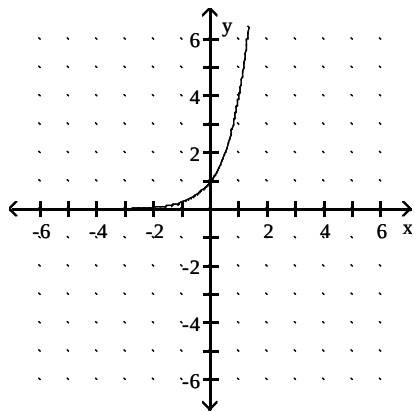
38) _____



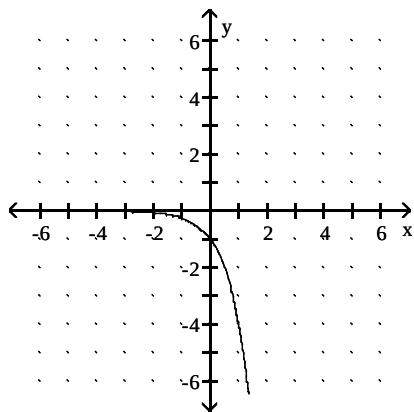
A)



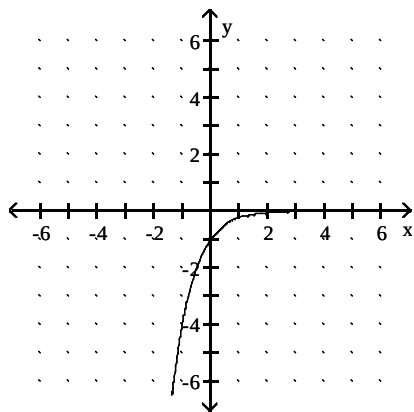
B)



C)



D)



Answer Key

Testname: SPRING 2014 REVIEW MATH 1314 EX 3

- 1) B
- 2) D
- 3) A
- 4) A
- 5) C
- 6) B
- 7) C
- 8) C
- 9) D
- 10) B
- 11) B
- 12) A
- 13) A
- 14) B
- 15) D
- 16) C
- 17) B
- 18) D
- 19) C
- 20) B
- 21) D
- 22) D
- 23) D
- 24) C
- 25) B
- 26) A
- 27) D
- 28) D
- 29) A
- 30) B
- 31) C
- 32) B
- 33) B
- 34) B
- 35) B
- 36) A
- 37) A
- 38) B