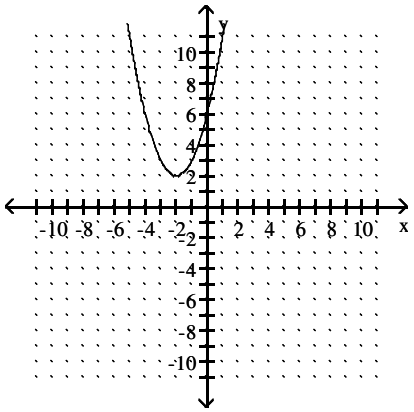
MATH 1314
Review #2

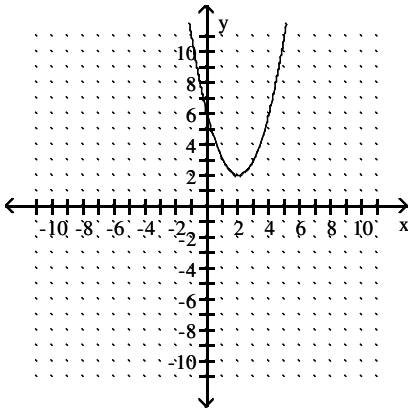
Name_____

NOTE: You must show your work to receive full credit. Simply stating the answer will not suffice.

The graph of a quadratic function is given. Determine the function's equation.

1) 

1) _____

2) 

2) _____

Find the coordinates of the vertex for the parabola defined by the given quadratic function.

3) $f(x) = (x - 4)^2 - 4$

3) _____

4) $f(x) = x^2 - 6$

4) _____

Find the axis of symmetry of the parabola defined by the given quadratic function.

5) $f(x) = (x + 4)^2 - 6$ 5) _____

Find the range of the quadratic function.

6) $f(x) = x^2 + 14x - 3$ 6) _____

Find the x–intercepts (if any) for the graph of the quadratic function.

7) $f(x) = -x^2 + 9x - 20$ 7) _____

Find the y–intercept for the graph of the quadratic function.

8) $f(x) = x^2 + 5x - 4$ 8) _____

Determine whether the given quadratic function has a minimum value or maximum value. Then find the coordinates of the minimum or maximum point.

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

Solve the problem.

10) You have 196 feet of fencing to enclose a rectangular region. Find the dimensions of the rectangle that maximize the enclosed area. 10) _____

Determine whether the function is a polynomial function.

11) $f(x) = 4x + 7x^5$ 11) _____

12) $f(x) = 2 - \frac{1}{x^4}$ 12) _____

Find the degree of the polynomial function.

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

Use the Leading Coefficient Test to determine the end behavior of the polynomial function.

14) $f(x) = -3x^4 + 4x^3 - 5x^2 - 4x - 1$ 14) _____

Find the zeros for the polynomial function and give the multiplicity for each zero. State whether the graph crosses the x–axis or touches the x–axis and turns around, at each zero.

15) $f(x) = 4(x - 2)(x + 1)^4$ 15) _____

16) $f(x) = x^3 + 8x^2 + 20x + 16$ 16) _____

Use the Intermediate Value Theorem to determine whether the polynomial function has a real zero between the given integers.

17) $f(x) = 3x^3 + 8x^2 + 5x + 5$; between –3 and –2 17) _____

Divide using long division.

18) $(x^2 - 5x - 6) \div (x - 6)$ 18) _____

19) $(12x^3 - 11x^2 + 10x + 5) \div (-3x - 1)$ 19) _____

Use long division and the Remainder Theorem to find the indicated function value.

20) $f(x) = 2x^3 - 5x^2 - 4x + 7$; $f(-2)$ 20) _____

Solve the problem.

21) Solve the equation $2x^3 - 23x^2 + 71x - 30 = 0$ given that 5 is a zero of $f(x) = 2x^3 - 23x^2 + 71x - 30$. 21) _____

Use the Rational Zero Theorem to list all possible rational zeros for the given function.

22) $f(x) = 5x^3 - x^2 + 3$ 22) _____

23) $f(x) = 3x^4 + 3x^3 - 3x^2 + 2x - 12$ 23) _____

Find the domain of the rational function.

24) $g(x) = \frac{4x}{x + 3}$ 24) _____

25) $f(x) = \frac{x + 8}{x^2 - 4}$ 25) _____

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

26) $h(x) = \frac{x}{x + 3}$ 26) _____

27) $g(x) = \frac{x - 1}{x(x + 3)}$ 27) _____

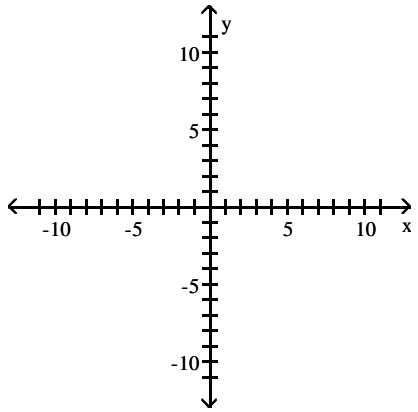
Find the horizontal asymptote, if any, of the graph of the rational function.

28) $f(x) = \dfrac{12x}{3x^2 + 1}$ 28) _____

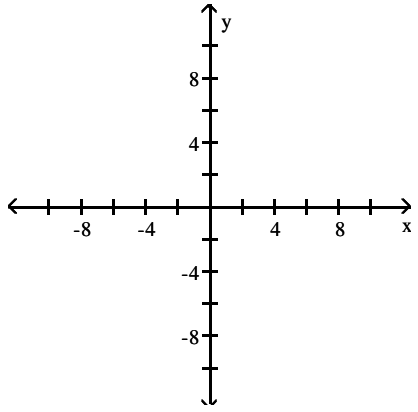
29) $h(x) = \dfrac{20x^3}{5x^2 + 1}$ 29) _____

Use transformations of $f(x) = \dfrac{1}{x}$ or $f(x) = \dfrac{1}{x^2}$ to graph the rational function.

30) $f(x) = \dfrac{1}{x + 2} + 2$ 30) _____

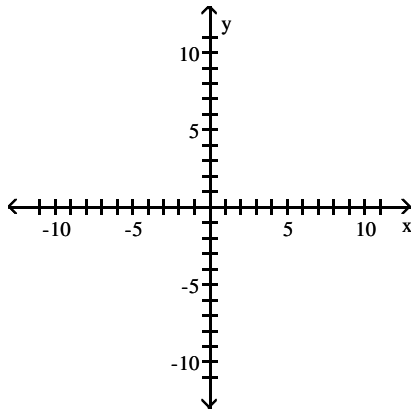


31) $f(x) = \dfrac{1}{x^2} + 2$ 31) _____



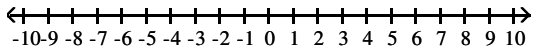
Graph the rational function.

32) $f(x) = \dfrac{3x}{x^2 - 9}$ 32) _____

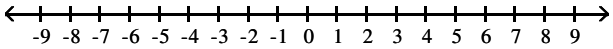


Solve the polynomial inequality and graph the solution set on a number line. Express the solution set in interval notation.

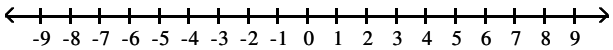
33) $(x - 6)(x + 5) > 0$ 33) _____



34) $x^2 + 5x - 6 > 0$ 34) _____

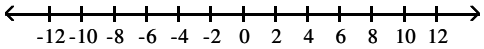


35) $x^2 - 6x - 7 \leq 0$ 35) _____

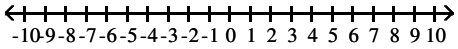


Solve the rational inequality and graph the solution set on a real number line. Express the solution set in interval notation.

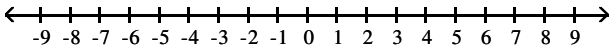
36) $\frac{x+7}{x+2} < 7$ 36) _____



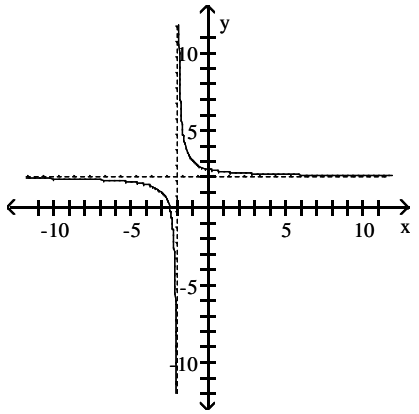
37) $\frac{12-2x}{6x+7} \leq 0$ 37) _____



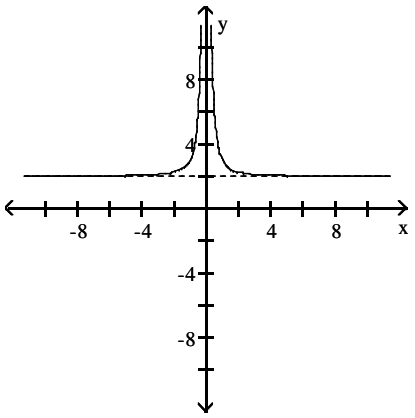
38) $\frac{x-3}{x+2} < 0$ 38) _____



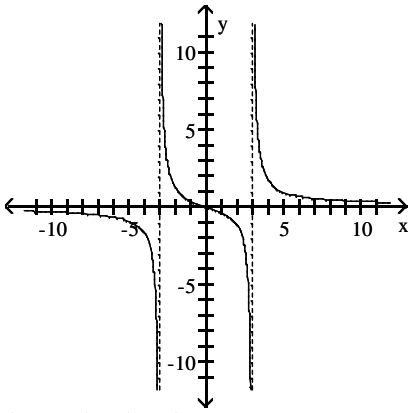
1) $f(x) = (x + 2)^2 + 2$
2) $h(x) = (x - 2)^2 + 2$
3) (4, –4)
4) (0, –6)
5) $x = -4$
6) $[-52, \infty)$
7) (4, 0) and (5, 0)
8) (0, –4)
9) minimum; $(-1, -10)$
10) 49 ft by 49 ft
11) Yes
12) No
13) 6
14) falls to the left and falls to the right
15) 2, multiplicity 1, crosses x–axis; –1, multiplicity 4, touches x–axis and turns around
16) –2, multiplicity 2, touches the x–axis and turns around;
–4, multiplicity 1, crosses the x–axis.
17) $f(-3) = -19$ and $f(-2) = 3$; yes
18) $x + 1$
19) $-4x^2 + 5x - 5$
20) –21
21) $\left\{5, 6, \frac{1}{2}\right\}$
22) $\pm\frac{1}{5}, \pm\frac{3}{5}, \pm 1, \pm 3$
23) $\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12, \pm\frac{1}{3}, \pm\frac{2}{3}, \pm\frac{4}{3}$
24) $\{x \mid x \neq -3\}$
25) $\{x \mid x \neq -2, x \neq 2\}$
26) $x = -3$
27) $x = 0$ and $x = -3$
28) $y = 0$
29) no horizontal asymptote
30)



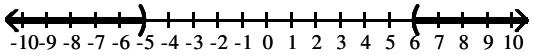
31)



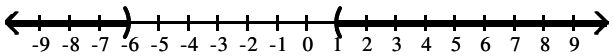
32)



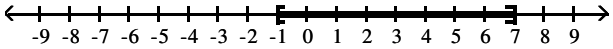
33) $(-\infty, -5) \cup (6, \infty)$



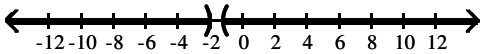
34) $(-\infty, -6) \cup (1, \infty)$



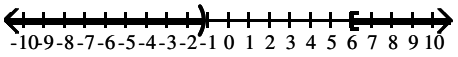
35) $[-1, 7]$



36) $(-\infty, -2)$ or $(-\frac{7}{6}, \infty)$



37) $\left(-\infty, -\frac{7}{6}\right]$ or $[6, \infty)$



38) $(-2, 3)$