AP Precalculus

Name: _____ Date:_____

Corrective Assignment

Unit 1B – Polynomial and Rational Functions

CALCULATOR ACTIVE for questions 1-4.

1. Use the function to answer the following.

$$f(x) = \frac{2x + 1}{x^2 - 3x - 10}$$

a. Domain:

b. Zero(s):

c. Hole(s):

d. Vertical Asymptote(s):

e. *y*-intercept:

f. Fill in the tables below.

x	$-10{,}000$	$-1{,}000$	-100	100	$1{,}000$	$10{,}000$
$f(x)$						

g. End Behavior:

h. Equation of the horizontal asymptote: (if one exists)

x	-2.1	-2.01	-2.001	-2	-1.999	-1.99	-1.9
$f(x)$							

i. $\lim_{x \to -2^-} f(x) =$

j. $\lim_{x \to -2^+} f(x) =$

2. Find the 3rd term when $(2x - 3)^6$ is expanded.

3. The value of a specific Beanie Baby over time is shown below starting with the year 1995.

Years since 1995	Value $
0	14
1	12
2	9
3	7.5
5	6
8	8
11	16
14	29
16	41
18	54
20	71

a. Is the data Linear, Quadratic, or Cubic ?

b. Write the equation of the regression curve.

c. Use your equation to predict the value of the Beanie Baby in 1999.

d. Find the average rate of change from 2000 to 2010.

4. F is inversely proportional to the square of r. If $F = 80$ when $r = 5$, find F when $r = 8$.

NO CALCULATOR for questions 5-25.

Vertical Asymptotes and Holes:

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

a. Domain:

b. Hole(s):

c. Zero(s):

d. Vertical Asymptote(s):

6. $$d(t) = \frac{t^2-9}{t+3}$$

a. Domain:

b. Hole(s):

c. Zero(s):

d. Vertical Asymptote(s):

7. $$r(x) = \frac{x^2-x-20}{2x-8}$$

a. Domain:

b. Hole(s):

c. Zero(s):

d. Vertical Asymptote(s):

Horizontal and Slant Asymptotes:

8. $f(x) = \frac{4x^4-3x^3+4x+1}{5x^3-2x^2+1}$

Circle one:

The graph of f has a horizontal asymptote.

The graph of f has a slant asymptote.

The graph of f does not have a horziontal or slant asymptote.

9. $f(x) = \frac{2x^4+x^2+1}{3x^5-2x^2+5x}$

Circle one:

The graph of f has a horizontal asymptote.

The graph of f has a slant asymptote.

The graph of f does not have a horziontal or slant asymptote.

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

Circle one:

The graph of f has a horizontal asymptote.

The graph of f has a slant asymptote.

The graph of f does not have a horziontal or slant asymptote.

11. Find the equation of the slant asymptote.

$$f(x) = \frac{4x^3-5x+3}{2x^2+3x}$$

12. Use the function to answer the following.

$$f(x) = \frac{2x(x-5)}{x^2 - 2x - 15}$$

a. Domain:

b. Zero(s):

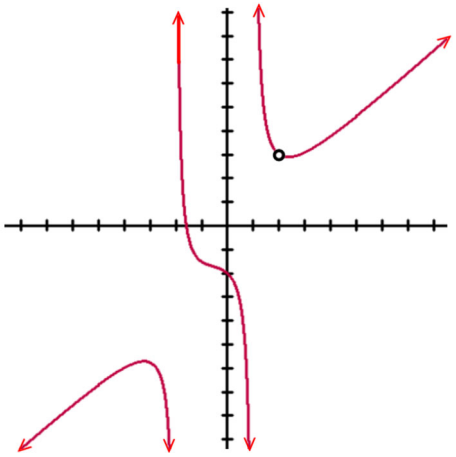
c. Hole(s):

d. Vertical Asymptote(s):

e. Horizontal Asymptote:

f. *y*-intercept:

13. Use the function to answer the following.



a. Domain:

b. Zero(s):
(Approximate)

c. *y*-intercept:

d. Limit Notation Hole(s):

e. End Behavior:

f. Limit Notation Vertical Asymptote(s):

g. Circle the statement that describes the graph:

The graph of f has a horizontal asymptote.

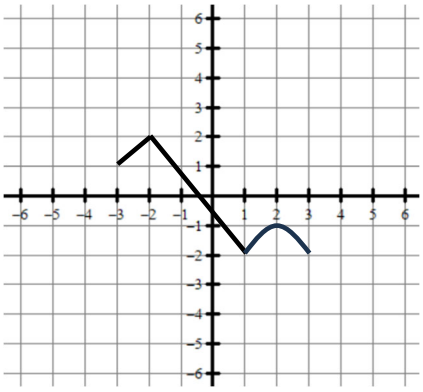
The graph of f has a slant asymptote.

The graph of f does not have a horziontal or slant asymptote.

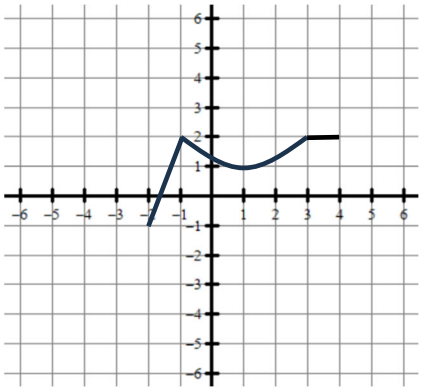
TRANSFORMATIONS

GRAPHICALLY

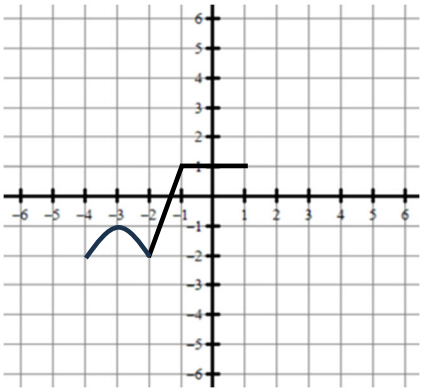
14. $g(x) = f(x-3) + 4$



15. $g(x) = -f(2x) + 5$



16. $g(x) = 3f(x-1)$



ALGEBRAICALLY

17. $f(x) = x^2 + 3x - 5$

$g(x) = f(x+2)$, find $g(x)$.

18. $f(x) = 2x^2 + 4x$

$g(x) = \frac{1}{2}f(x) - 5$, find $g(x)$.

19. $f(x) = 3x + 1$

$g(x) = -f(3x) + 4$, find $g(x)$.

NUMERICALLY

20. Given the table of values for f.

x	$f(x)$
-2	12
-1	18
0	5
1	-12
2	-3

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

find $g(1)$.

21. Given the table of values for f.

x	$f(x)$
0	12
1	9
2	6
3	3
4	0

Let $g(x) = -2f(x-1) - 3$,

find $g(1)$.

DOMAIN and RANGE

22.
Given the graph for f has a domain of $(-1,3)$ and range of $[-5,10]$.
Let $g(x) = 4f(x+1)$.
Find the domain and range of $g(x)$.

23.
Given the graph for f has a domain of $[-10,4]$ and range of $[-3,6]$.
Let $g(x) = f(2[x-2]) + 4$.
Find the domain and range of $g(x)$.

Answers to Unit 1B Corrective Assignment

1. a. $(-\infty,-2) \cup (-2,5) \cup (5,\infty)$
   b. $x = -\frac{1}{2}$
   c. none
   d. $x = -2$ and 5
   e. $y = -\frac{1}{10}$
   f. see below
   g. $\lim_{x\to-\infty} f(x) = 0$ $\lim_{x\to\infty} f(x) = 0$
   h. $y = 0$
   i. $\lim_{x\to-2^-} f(x) = -\infty$
   j. $\lim_{x\to-2^+} f(x) = \infty$

x	−10,000	−1,000	−100	100	1,000	10,000
$f(x)$	−0.0002	−0.002	−0.019	0.021	0.002	0.0002

x	−2.1	−2.01	−2.001	−2	−1.999	−1.99	−1.9
$f(x)$	−4.507	−43.081	−428.79	undefined	428.347	42.632	4.058

2. $2160x^4$

3. a. quadratic
   b. $f(x) = 0.298x^2 - 3.127x + 14.246$
   c. $f(4) = 6.505$
   d. 2.833 $ per year

4. $F = 31.25$

5. a. $(-\infty,0) \cup (0,2) \cup (2,\infty)$
   b. $x = 2$
   c. $x = -4$
   d. $x = 0$

6. a. $(-\infty,-3) \cup (-3,\infty)$
   b. $t = -3$
   c. $t = 3$
   d. No Vertical Asymptotes

7. a. $(-\infty,4) \cup (4,\infty)$
   b. No Holes
   c. $x = -4$ and 5
   d. $x = 4$

8. The graph of f has a slant asymptote.

9. The graph of f has a horizontal asymptote.

(answers continued on back)

Answers to Unit 1B Corrective Assignment

10. The graph of f has a horizontal asymptote.

11. $y = 2x - 3$

12.

a. $(-\infty, -3) \cup (-3,5) \cup (5, \infty)$

b. $x = 0$

c. $x = 5$

d. $x = -3$

e. $y = 2$

f. $(0, 0)$

13.

a. $(-\infty, -2) \cup (-2,1) \cup (1,2) \cup (2, \infty)$

b. $x \approx -1.6$

c. $(0, -2)$

d. $\lim_{x \to 2^-} f(x) = 3$ and $\lim_{x \to 2^+} f(x) = 3$

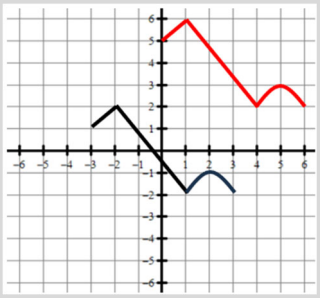
e. $\lim_{x \to -\infty} f(x) = -\infty$ and $\lim_{x \to \infty} f(x) = \infty$

f. $\lim_{x \to -2^-} f(x) = -\infty$ and $\lim_{x \to -2^+} f(x) = \infty$

$\lim_{x \to 1^-} f(x) = -\infty$ and $\lim_{x \to 1^+} f(x) = \infty$

g. The graph of f has a slant asymptote.

14.



15.

16.

17. $g(x) = x^2 + 7x + 5$

18. $g(x) = x^2 + 2x - 5$

19. $g(x) = -9x + 3$

20. $g(1) = 14$

21. $g(1) = -27$

22. Domain: $(-2,2)$
Range: $[-20,40]$

23. Domain: $[-3,4]$
Range: $[1,10]$