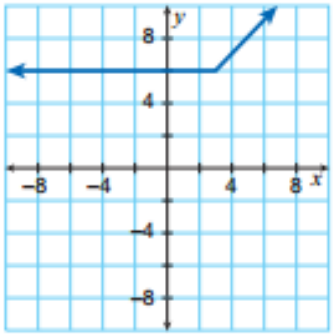
Precalculus Spiral Review

1. $f(x) = \frac{x^2+4}{x^3-x}$; determine whether this function is even or odd

2. Identify the intervals where the function is increasing, decreasing, and/or constant.



3. Which describes the end behavior of the graph of $f(x) = 2x^3 - 5x + 1$?

F $\lim_{x \to -\infty} f(x) = \infty$, $\lim_{x \to \infty} f(x) = \infty$

G $\lim_{x \to -\infty} f(x) = -\infty$, $\lim_{x \to \infty} f(x) = -\infty$

H $\lim_{x \to -\infty} f(x) = -\infty$, $\lim_{x \to \infty} f(x) = \infty$

J $\lim_{x \to -\infty} f(x) = \infty$, $\lim_{x \to \infty} f(x) = -\infty$

4. Divide $(x^3 + 5x^2 + 5x - 2)$ by $(x + 2)$ using synthetic division.

A $x^2 + 7x + 19 + \frac{36}{x+2}$

B $x^2 + 4$

C $x^2 + 3x - 1$

D $x^2 + 7x - 9 + \frac{16}{x+2}$

5. **FINANCE** For a period of x days, an account balance can be modeled by $f(x) = x^3 - x^2 - 8x$. When was the balance \$60?

A Day 5 B Day 8 C Day 9 D Day 10

6. What are the vertical asymptotes of $f(x) = \frac{x^2-4}{x^2-9}$?

F $x = 0$ G $x = 1$ H $x = \pm 2$ J $x = \pm 3$

7. **MEDICINE** The concentration of a medicine is modeled by $f(x) = \frac{2x}{3x^2+1}$. What is the horizontal asymptote of the graph of the function?

A $y = -\frac{1}{3}$ B $y = 0$ C $y = \frac{2}{3}$ D $y = 2$

8. Find the polynomial function of least degree with real coefficients in standard form that has the zeros −3, 0, and 3.

F $f(x) = x^3 + x^2 + 3x - 9$

G $f(x) = x^3 + 9x$

H $f(x) = x^3 - 9x$

J $f(x) = x^3 + x^2 - 3x - 9$

9. **TEMPERATURE** The low temperature for a city every other day is shown. Which function best models the data?

x	0	2	4	6	8	10	12	14	16	18	20
f(x)	2	5	5	4	2	0	−2	−2	0	5	14

A $f(x) = 0.2x^3 - 0.4x^2 + 2.2x + 2$

B $f(x) = 2x^3 - 40x^2 + 217x + 199$

C $f(x) = 0.02x^3 - 0.4x^2 + 2.17x + 1.99$

D $f(x) = 0.02x^3 - 4x^2 + 2.17x - 1.99$

10. According to Descartes' Rule of Signs, how many positive real zeros could $f(x) = x^4 + 5x^3 - 2x^2 - 6x + 13$ have?

F 0 G 1 or 3 H 2 J 2 or 0