Precalculus Name_____ ID: 1

Midterm Review #2

Date_____ Period____

Describe the end behavior of each function.

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

A) Falls to the left. Rises to the right
B) Falls to the left. Falls to the right
C) Rises to the left. Falls to the right
D) Rises to the left. Rises to the right

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

A) Rises to the left. Rises to the right
B) Falls to the left. Falls to the right
C) Rises to the left. Falls to the right
D) Falls to the left. Rises to the right

State the possible number of real zeros for each function. Then find all zeros.

3) $f(x) = x^4 - 14x^2 + 45$

A) Possible # of real zeros: 6
Zeros: $\{\sqrt{5}, -\sqrt{5}, 3, -3\}$
B) Possible # of real zeros: 4, 2, or 0
Zeros: $\{\sqrt{5}, -\sqrt{5}, -3 \text{ mult. } 2\}$
C) Possible # of real zeros: 3
Zeros: $\{\sqrt{5}, -\sqrt{5}, -2, -3\}$
D) Possible # of real zeros: 4, 2, or 0
Zeros: $\{\sqrt{5}, -\sqrt{5}, 3, -3\}$

4) $f(x) = x^4 + 4x^2 - 45$

A) Possible # of real zeros: 4, 2, or 0
Zeros: $\{2i, -2i, 3i, -3i\}$
B) Possible # of real zeros: 3 or 1
Zeros: $\left\{\frac{\sqrt{15}}{3}, -\frac{\sqrt{15}}{3}, 3i, -3i\right\}$
C) Possible # of real zeros: 3
Zeros: $\{i\sqrt{5}, -i\sqrt{5}, 3i, -3i\}$
D) Possible # of real zeros: 4, 2, or 0
Zeros: $\{\sqrt{5}, -\sqrt{5}, 3i, -3i\}$

5) $f(x) = x^4 + 3x^2 - 18$

A) Possible # of real zeros: 3
Zeros: $\{2i, -2i, i\sqrt{6}, -i\sqrt{6}\}$
B) Possible # of real zeros: 4, 2, or 0
Zeros: $\{\sqrt{3}, -\sqrt{3}, i\sqrt{2}, -i\sqrt{2}\}$
C) Possible # of real zeros: 3 or 1
Zeros: $\{i, -i, 2i\sqrt{2}, -2i\sqrt{2}\}$
D) Possible # of real zeros: 4, 2, or 0
Zeros: $\{\sqrt{3}, -\sqrt{3}, i\sqrt{6}, -i\sqrt{6}\}$

State if the given binomial is a factor of the given polynomial.

6) $(8b^3 - 56b^2 - 54b - 73) \div (b - 8)$

A) No B) Yes

7) $(8b^3 - 79b^2 - 12b + 17) \div (b - 10)$

A) Yes B) No

Solve each equation. Remember to check for extraneous solutions.

8) $\frac{1}{2x^2} - \frac{2}{3} = \frac{4x - 5}{6x^2}$

A) $\{1, -2\}$ B) $\{1, 2\}$
C) $\{1, -3\}$ D) $\{-3\}$

9) $\frac{1}{6x} = \frac{x + 3}{6} + \frac{x + 4}{6x}$

A) $\{-3\}$ B) $\{-3, -1\}$
C) $\{4, -3\}$ D) $\{-3, 6\}$

10) $\frac{2b + 8}{3b^2} - \frac{b^2 - 8b + 15}{2b^2} = \frac{5b - 15}{6b^2}$

A) $\{-7, 7\}$ B) $\{7, -6\}$
C) $\{7\}$ D) $\left\{7, \frac{2}{3}\right\}$

11) $\frac{4}{b^2} = \frac{3b^2 - 9b - 12}{b^2} + \frac{1}{b}$

A) $\left\{4, -\frac{4}{3}\right\}$ B) $\left\{\frac{2}{3}, \frac{4}{3}\right\}$
C) $\left\{\frac{2}{3}\right\}$ D) $\left\{4, \frac{4}{3}\right\}$

Answers to Midterm Review #2 (ID: 1)

1) C
2) D
3) D
4) D
5) D
6) A
7) B
8) A
9) B
10) D
11) A