

HW #20

Describe the end behavior of each function.

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

$f(x) \rightarrow +\infty \text{ as } x \rightarrow -\infty$

$f(x) \rightarrow -\infty \text{ as } x \rightarrow +\infty$

2) $f(x) = 2x^2 + 8x + 5$

$f(x) \rightarrow +\infty \text{ as } x \rightarrow -\infty$

$f(x) \rightarrow +\infty \text{ as } x \rightarrow +\infty$

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

$f(x) \rightarrow +\infty \text{ as } x \rightarrow -\infty$

$f(x) \rightarrow +\infty \text{ as } x \rightarrow +\infty$

4) $f(x) = x^3 - x^2 - 1$

$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty$

$f(x) \rightarrow +\infty \text{ as } x \rightarrow +\infty$

Divide using LONG DIVISION.

5) $(6x^3 + 25x^2 - 33x - 44) \div (x + 5)$

$$6x^2 - 5x - 8 - \frac{4}{x + 5}$$

Divide using SYNTHETIC DIVISION.

6) $(r^4 - 2r^3 - 46r^2 + 15r + 9) \div (r + 6)$

$$r^3 - 8r^2 + 2r + 3 - \frac{9}{r + 6}$$

Evaluate each function at the given value (Remainder Theorem)

7) $f(a) = 5a^4 - 19a^3 - 36a^2 + 33a - 23$ at $f(5)$
-8

8) $f(n) = -2n^3 - 6n^2 + 31n - 41$ at $n(-6)$
-11

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

9) $(5a^3 - 41a^2 + 38a + 32) \div (a - 7)$
No

10) $(5x^3 + 36x^2 + 43x + 42) \div (x + 6)$
Yes

Determine all Linear Factors AND zeros

11) $x^3 - 8x^2 + 4x + 48 \div (x - 4)$
Linear Factors: $(x-4)(x-6)(x+2)$
Zeros: $\{4, 6, -2\}$

12) $x^3 + 5x^2 + 2x - 8 \div (x - 1)$
Linear Factors: $(x-1)(x+4)(x+2)$
Zeros: $\{1, -4, -2\}$