SM3H Name_____

Polynomials Extra WKS

Date_____ Period____

Use the Remainder Theorem to determine if the given value is a root to the polynomial or not and state the remainder.

1) $f(n) = -5n^4 + 16n^3 - 7n^2 - 10n - 7$ at $n = 2$

2) $f(n) = -4n^4 + 29n^3 - 34n^2 + 18n + 25$ at $n = 6$

3) $f(x) = x^4 - 7x^3 + 10x^2 + 2x + 1$ at $x = 5$

4) $f(m) = m^4 - 10m^3 + 28m^2 - 18m + 9$ at $m = 5$

Divide.

5) $(9n^3 + 63n^2 + 52n - 6) \div (n + 6)$

6) $(6n^3 - 29n^2 - 2n - 6) \div (n - 5)$

7) $(n^3 + 7n^2 - n + 3) \div (n - 1)$

8) $(3x^3 - 8x^2 - 70x + 54) \div (x - 6)$

State the possible rational zeros for each function. Then find all rational zeros using the remainder theorem.

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

10) $f(x) = 3x^3 - 31x^2 + 43x - 11$

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

12) $f(x) = 5x^3 - 49x^2 - 45x - 7$

13) $f(x) = 2x^3 + 17x^2 + 16x + 4$

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

Factor each using the rational root theorem.

15) $x^3 - 3x - 2 = 0$

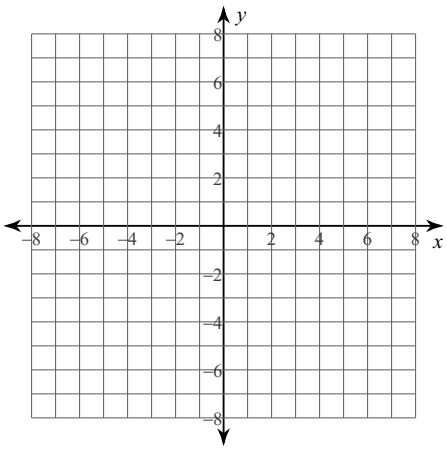
16) $x^3 - 15x^2 + 27x - 13 = 0$

17) $x^4 - 3x^3 - x^2 + 3x = 0$

18) $x^3 - 2x^2 - x + 2 = 0$

Sketch the graph of each function. State the number of real zeros.

19) $f(x) = -x^3 + 3x^2$



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