Name_____

Daring to Divide

Use the Remainder Theorem to determine if the given polynomial is divisible by the binomial (with no remainder). If there is no remainder, then divide to find the quotient.

1)
$$\frac{6x^3 - 10x^2 + 4x - 14}{x - 2}$$

2) $$\frac{x^3 + 10x^2 + 24x + 66}{x + 8}$$

3) $$\frac{7x^3 - 11x^2 - 3x - 6}{x - 2}$$

4) $$\frac{8x^3 - 21x^2 + 7x + 6}{x - 2}$$

Completely factor the following polynomials. One rational zero has been given. Find all real solutions where $f(x) = 0$.

5) $f(x) = x^3 + 4x^2 - 3x - 18$; $f(-3) = 0$

6) $f(x) = x^4 - x^3 - 17x^2 - 15x$; $f(5) = 0$

7) $f(x) = x^5 + 5x^4 - 12x^3 - 60x^2 + 36x + 180$; $f(-5) = 0$

8) $f(x) = 9x^5 - 6x^4 - 60x^3 + 40x^2 + 36x - 24;$ $f\left(\dfrac{2}{3}\right) = 0$

Do not use $(x - \dfrac{2}{3})$ as a factor.

9) $f(x) = -3x^4 - 5x^3 + 24x + 40;$ $f\left(-\dfrac{5}{3}\right) = 0$

10) $f(x) = 6x^5 + 30x^4 - 8x^3 - 40x^2 + 2x + 10;\ f(-5) = 0$