Name_____

Factor(Factor)(Factor) - Extra

Factor each completely, then solve for when $f(x) = 0$.

1) $f(x) = 16x^4 - 1$

2) $f(x) = 64x^6 - 1$

3) $f(x) = 48x^2 - 75$

4) $f(x) = -3x^8 - 57x^5 + 648x^2$

5) $f(x) = -343x^7 + 125x$

6) $f(x) = 125x - 216x^7$

7) $f(x) = 8x^2 + 125x^8$

8) $f(x) = -125x^6 - 216$

9) $f(x) = -256x^5 + 484x^3$

10) $f(x) = x^4 + 19x^3 + 90x^2$

11) $f(x) = x^4 + 16x^2 + 63$

12) $f(x) = 216x^8 + 343x^2$

Answers to Factor(Factor)(Factor) - Extra

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

$x = -\dfrac{1}{2}, \; x = \dfrac{1}{2}$

2)

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

$x = -\dfrac{5}{4}, \; x = \dfrac{5}{4}$

4) $f(x) = -3x^2(x - 2)(x + 3)(x^2 + 2x + 4)(x^2 - 3x + 9)$

$x = 0$ (double root), $x = -3$, $x = 2$

5) $f(x) = -x(7x^2 - 5)(49x^4 + 35x^2 + 25)$

$x = 0, \; x = -\sqrt{\dfrac{5}{7}}, \; x = \sqrt{\dfrac{5}{7}}$

6) $f(x) = -x(6x^2 - 5)(36x^4 + 30x^2 + 25)$

$x = 0, \; x = -\sqrt{\dfrac{5}{6}}, \; x = \sqrt{\dfrac{5}{6}}$

7) $f(x) = x^2(5x^2 + 2)(25x^4 - 10x^2 + 4)$

$x = 0$ (double root)

8) $f(x) = -(5x^2 + 6)(25x^4 - 30x^2 + 36)$

No real solutions

9) $f(x) = -4x^3(8x - 11)(8x + 11)$

$x = 0$ (triple root), $x = -\dfrac{11}{8}, \; x = \dfrac{11}{8}$

10) $f(x) = x^2(x + 10)(x + 9)$

$x = 0$ (double root), $x = -10$, $x = -9$

11) $f(x) = (x^2 + 7)(x^2 + 9)$

No real solutions

12) $f(x) = x^2(6x^2 + 7)(36x^4 - 42x^2 + 49)$

$x = 0$ (double root)