Name Key

Write the each polynomial in its factored form. Factor completely.

a) $y = x^3 + 4x^2 - 12x$

$y = x(1x^2 + 4x - 12)$ $a=1$, "easy"

$y = x(x+6)(x-2)$

-12 / 6 -2 / 4

b) $y = 10x^2 - 15x$

$y = 5x(2x-3)$

c) $2x^3 + 10x^2 + 12x$

$2x(1x^2 + 5x + 6)$ $a=1$, "easy"

6 / 2 3 / 5

$2x(x+2)(x+3)$

d) $6x^3 - 15x^2 - 36x$

$3x(2x^2 - 5x - 12)$ $a=2$; with Grouping

$3x[2x^2 - 8x + 3x - 12]$

-24 / -8 3 / -5

$3x[2x(x-4) + 3(x-4)]$

$3x(x-4)(2x+3)$

e) $3x^4 - 18x^3 + 24x^2$

$3x^2(x^2 - 6x + 8)$ $a=1$ "easy"

8 / -4 -2 / -6

$3x^2(x-2)(x-4)$

f) $x^3 - 9x$

$x(x^2 - 9)$ "easy" $a=1$

-9 / 3 -3 / 0

$x(x-3)(x+3)$

* Also a DPS $(\sqrt{x^2} - \sqrt{9})$

g) $x^4 + x = x(x^3 + 1)$

more on this, later

h) $12x^2 - 64x + 80$

$4(3x^2 - 16x + 20)$ $a=3$; with box

60 / -6 -10 / -16

	x	-2
3x	$3x^2$	$-6x$
-10	$-10x$	20

$4(x-2)(3x-10)$

i) $2x^4 + 22x^3 + 56x^2$

$2x^2(x^2 + 11x + 28)$ $a=1$ "easy"

28 / 7 4 / 11

$2x^2(x+4)(x+7)$

j) $35m^4 - 375m^3 + 250m^2$

$5m^2(7m^2 - 75m + 50)$ $a=7$; w/ fractions

350 / -70 -5 / -75

$\frac{7m}{-70} = \frac{m}{-10}$, $\frac{7m}{-5}$

$5m^2(m-10)(7m-5)$