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Precalc Name_____ ID: 1

Essential Skills: Factoring and Dividing Polynomials Date_____ Period____

Factor each completely.

1) $4n^3 - n^2 - 20n + 5$

$(4n^3-n^2)(-20n+5)$

$n^2(4n-1)-5(4n-1)$

$(n^2-5)(4n-1)$

2) $2n^2 - 11n + 12$

$n^2-11n+24$

24, -3, -8, -11

$(n-3)(n-8)$

$\frac{}{2}$ $\frac{}{2}$

$(2n-3)(n-4)=0$

$2n-3=0$ $n-4=0$

$n=3/2$ $n=4$

3) $4x^3 + 8x^2 - 140x$

$4x(x^2+2x-35)$

$4x(x+7)(x-5)$ 7×-5, -35, 2

$\boxed{4x(x+7)(x-5)}$

4) $6k^3 - 40k^2 + 50k$

$2k(3k^2-20k+25)$

$2k(k-20k+75)$

$2k(k-15)(k-5)$ $\frac{}{3}$ $\frac{}{3}$ -15×-5, 75, -20

$\boxed{2k(k-5)(3k-5)}$

5) $x^4 + 11x^2 + 24$

$(x^2)^2 + 11(x^2) + 24$

let $x^2 = t$

$(t)^2 + 11(t) + 24$

$(t+8)(t+3)$

sub x^2 back in

$\boxed{(x^2+8)(x^2+3)}$

6) $9n^2 - 25$

$(3n)^2 - (5)^2$

$\boxed{(3n-5)(3n+5)}$

use difference of squares pattern...

$A^2 - B^2 \leftrightarrow (A-B)(A+B)$

7) $r^2 - 4r + 4$

$(r-2)(r-2)$

$-2 \cdot -2 = 4$

$-2 + -2 = -4$

$\boxed{(r-2)^2}$

8) $8x^3 + 1$

$(2x)^3 + (1)^3$ use sum of cubes pattern

$A^3 + B^3 \leftrightarrow (A+B)(A^2 - AB + B^2)$

$(2x+1)[(2x)^2 - (2x)(1) + (1)^2]$

$\boxed{(2x+1)(4x^2 - 2x + 1)}$

Divide.

9) $(7n^3 + 59n^2 + 10n - 3) \div (7n + 3)$

n^2+8n-2 R3

$7n+3 \overline{)\,7n^3+59n^2+10n-3}$

$-(7n^3+3n^2)$ ↓

$56n^2+10n$

$-(56n^2+24n)$

$-14n-3$

$-(-14n-6)$

3

$n^2+8n-2+\frac{3}{7n+3}$

10) $(x^3 + 5x^2 + 8) \div (x + 5)$

-5 | 1 5 0 8

| −5 0 0

1 0 0 8

x^2 x C R

$x^2+\frac{8}{x+5}$