(26) $\quad 8ab^3 + 27a^4 \qquad \S 5.7$

$= a(8b^3 + 27a^3)$

$8b^3 = 2^3b^3 = (2b)^3$

$27a^3 = 3^3a^3 = (3a)^3$

$\underline{x^3 + y^3 = (x+y)(x^2 - xy + y^2)}$

$a((2b)^3 + (3a)^3) =$

$= (2b + 3a)((2b)^2 + (2b)(3a) + (3a)^2)$

$= (2b + 3a)(4b^2 + 6ab + 9a^2)$

whiz dumb

$$x^n = \underbrace{x \cdot x \cdot \dots x}_{n \text{ of 'em}}$$

$$x^{-n} = \frac{1}{x^n}$$

$$x^a x^b = x^{a+b}$$

$$(x^a)^b = x^{ab}$$

$$(xy)^a = x^a y^a$$

$$\left(\frac{(3^2 x^5 y^{-7})^{10}}{(6^3 x^{-2} y^5)^5} \right)^{-4}$$

$$= \frac{(3^2 x^5 y^{-7})^{-40}}{(6^3 x^{-2} y^5)^{-20}}$$

Scratch:
$$(6)^3 = (2 \cdot 3)^3$$
$$= 2^3 \cdot 3^3$$
$$6^{-60} =$$
$$(2 \cdot 3)^{-60} =$$
$$2^{-60} 3^{-60}$$

Edward

$$= \frac{3^{-80} \, x^{-200} \, y^{-280}}{6^{-60} \, x^{40} \, y^{-100}}$$

$$= \boxed{\frac{3^{-80}}{2^{-60} \cdot 3^{-60}}} \times^{-200-40} \, y^{-280-(-100)}$$

$$\frac{2^{60}}{3^{20}}$$

$$= \frac{2^{60} \cdot 3^{60}}{3^{80}} \cdot x^{-240} \, y^{-280+100}$$

$$2^{60} \cdot 3^{-80-(-60)}$$
$$= 2^{60} \cdot 3^{-80+60}$$
$$= 2^{60} \cdot 3^{-20}$$
$$= \frac{2^{60}}{3^{20}}$$

$$= 2^{60} \cdot 3^{60-80} \cdot \frac{1}{x^{240}} \cdot \frac{1}{y^{180}}$$

$$= \frac{2^{60}}{3^{20} x^{240} y^{180}}$$

$$= 12x^2 + 2x - 70$$

$$\frac{2 \mid 70}{5 \mid 35}$$
$$ 7$$

$$(12x \qquad)(1x \qquad)$$
$$(6x \qquad)(2x \qquad)$$
$$(4x - 10)(3x + 7) = 12x^2 - 2x - 70$$
$$(4x + 10)(3x - 7) = 12x^2 + 2x - 70$$

$$12x^2 + 2x - 70$$

$$(12)(-70) = -840$$

$2 = 3 - 1$	$(3)(-1) = -3$	Higher
$= 12 - 10$	$(12)(-10) = -120$	Higher
$= 22 - 20$	$(22)(-20) = -440$	Higher
$= 32 - 30$	$(32)(-30) = -960$	Lower
$= 27 - 25$	$(27)(-25) = -675$	Higher
$= 30 - 28$	$(30)(-28) = -840$	Sweet!

$$12x^2 + 2x - 70 = 12x^2 + 30x - 28x - 70$$

Edward
$$= 6x(2x + 5) - 7(4x + 10)$$

oops! 7 isn't GCF of 28 &70!

$$= 6x(2x + 5) - 14(2x + 5)$$

$$= (2x + 5)\left(\frac{6x(2x+5)}{(2x+5)} - \frac{14(2x+5)}{(2x+5)}\right)$$

$$= (2x + 5)\left(\frac{6x(2x+5)}{(2x+5)} - \frac{14(2x+5)}{(2x+5)}\right)$$

$$= (2x + 5)(6x - 14)$$

$$x^2 - 7x + 12$$

$$x^2 + x - 12$$

$$(2x+1)(5x-3)$$

$$10x^2 - x - 3$$

Playing
with factors
of $10x^2$ & -3
to "hit" the
$-x$ in the
middle.

$$(10x - 3)(1x + 1)$$
$$(10x + 1)(1x - 3)$$
$$(5x + 1)(2x - 3)$$
$$(5x + 3)(2x - 1)$$
$$= 10x^2 + 6x - 5x - 3$$
$$= 10x^2 + x - 3$$
$$(5x - 3)(2x + 1) = \checkmark$$

Oct 12-9:58 AM