Perfect Squares and Grouping too

Perfect Squares result when $ax^2 + bx + c$ factors to → $(px + q)^2$

Think about: $(2x + 3)^2$

$(2x + 3)(2x + 3)$ $4x^2 + 12x + 9$

These are perfect squares middle term = $2\sqrt{4}\sqrt{9}$

1) Factor (without using decomp)

a) $4x^2 - 28x + 49$

Check 28 = $2\sqrt{4}\sqrt{49}$ Yep! → $(2x - 7)(2x - 7)$

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b) $9x^2 + 6x + 1$

Check 6 = $2\sqrt{9}\sqrt{1}$ Yep! → $(3x + 1)(3x + 1)$

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c) $16x^2 - 24xy + 9y^2$

Check 24 = $2\sqrt{4}\sqrt{3}$ Yep! → $(4x - 3y)(4x - 3y)$

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2) What number would make the following perfect squares?

a) $144x^2$ - ____$xy + 49y^2$

middle = $2\sqrt{144}\sqrt{49}$ = 168 → $144x^2 - 168xy + 49y^2$

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b) $9x^2 - 30x +$ __

30 = $2\sqrt{9}\sqrt{?}$ $\sqrt{?} = 5$ → $9x^2 - 30x + 25$

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c) ___ $x^2 + 60x + 9$

60 = $2\sqrt{?}\sqrt{9}$ $\sqrt{?} = 10$ → $100x^2 + 60x + 9$

What if 4 terms showed up? 🤔

3) Factor the following

a) $x^2 - xd + 7x - 7d$

Try pairing with GCF's $x(x - d) + 7(x - d)$

Since brackets same … it worked 😊 → $(x - d)(x + 7)$

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b) $2ax^2 + 8ax + x + 4$

$2ax(x + 4) + 1(x + 4)$ → $(x + 4)(2ax + 1)$

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c) $xy + 8x - y^2 - 8y$

$x(y + 8) - y(y + 8)$ → $(y + 8)(x - y)$

Assignment = worksheet

Factor by grouping and Perfect squares too…

How did Snidely Spellbinder write a Four-letter word that begins with 'E'?

B	W	E	A	I	N	T	R	H	4	L	G	E	T	I	A	S	P	E	N
$(a-d)(d+3)$	$(u+2)(v+5)$	$(x+4)(x-k)$	$(a+d)(a-2)$	$(2y^2+1)(y+1)$	$(x+k)(x+3)$	$(a-d)(d-2)$	$(y^2+2)(y+1)$	$(x+k)(4x+3)$	$(u+v)(v+5)$	$(u^2+v^2)(u-v)$	$(x^2+1)(5y-1)$	$(7a+2)(b+7)$	$(t+3k)(t+2)$	$(m^2+n^2)(m+n)$	$(3t-k)(t+2)$	$(m^2-2)(m+n)$	$(2a+1)(b+7)$	$(2x+5)(5y-1)$	$(m-3)(m+n)$

1) $x^2 + 3x + xk + 3k$ ***2)*** $a^2 - 2a + ad - 2d$ ***3)*** $uv + 5u + v^2 + 5v$

4) $x^2 - xk + 4x - 4k$ ***5)*** $ad + 3a - d^2 - 3d$ ***6)*** $y^3 + y^2 + 2y + 2$

7) $m^3 + m^2n + mn^2 + n^3$ ***8)*** $u^3 - u^2v + uv^2 - v^3$ ***9)*** $t^2 + 2t + 3kt + 6k$

10) $2ab + 14a + b + 7$ ***11)*** $m^2 + mn - 3m - 3n$ ***12)*** $5x^2y - x^2 + 5y - 1$

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1) Factor the following perfect squares

a) $4x^2 + 28x + 49$ ***b)*** $16x^2 + 8xy + y^2$ ***c)*** $9x^2 - 42xy + 49y^2$

2) Find B so that the following are perfect squares

a) $4x^2 + Bx + 9$ **b)** $49x^2 + Bx + 1$ **c)** $16x^2 + Bx + 25$

d) $Bx^2 - 30x + 9$ **e)** $4x^2 + 56x + B$ **f)** $Bx^2 - 30x + 1$