

## Quiz 16

① Expand  $(x+5)^2$ .

Solution: Using distributive property  $a(b+c) = ab+ac$ ,

$$\begin{aligned}(x+5)^2 &= (x+5)(x+5) \\ &= (x+5)(x) + (x+5)(5) \\ &= (x^2+5x) + (5x+25) \\ &= x^2+10x+25\end{aligned}$$

(note: could also observe that it is a "perfect square")

② Expand  $(x-6)(x+6)$ .

Solution: By distributive property,

$$\begin{aligned}(x-6)(x+6) &= (x-6)x + (x-6)(6) \\ &= (x^2-6x) + (6x-36) \\ &= x^2+12x-36\end{aligned}$$

(note: could also observe that it is a "difference of squares")

③ Expand  $(2x+3)(5x-1)$

Solution: By distributive property,

$$\begin{aligned}(2x+3)(5x-1) &= (2x+3)(5x) + (2x+3)(-1) \\ &= (10x^2+15x) + (-2x-3) \\ &= 10x^2+13x-3\end{aligned}$$

④ Factor  $10x^2 + 30x + 20$

Solution: First factor out a factor of 10:

$$10x^2 + 30x + 20 = 10 \left[ x^2 + 3x + 2 \right]$$

Seek:  $p$  and  $q$  such that  $\left\{ \begin{array}{l} p \cdot q = 2 \\ p + q = 3 \end{array} \right.$  factor this

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answer:  $\boxed{p=2, q=1}$

Therefore

$$10x^2 + 30x + 20 = 10(x+2)(x+3)$$

⑤ Factor  $x^2 - 6x + 9$ .

Solution: Seek  $p, q$  so that

$$\left\{ \begin{array}{l} p \cdot q = 9 \\ p + q = -6 \end{array} \right.$$

answer:  $\boxed{p=-3, q=-3}$

Therefore

$$x^2 - 6x + 9 = (x-3)(x-3) = (x-3)^2$$

(note: could also observe that this is a perfect square)