Factor each polynomial COMPLETELY
in your notebook

① $3x^2 - 75$

Difference

$3(x^2 - 25)$

Perfect square
$\sqrt{x^2} = x$

Perfect square
$\sqrt{25} = 5$

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

④ $2x^2 - 24x + 72$

$2(x^2 - 12x + 36)$

Perfect square
$\sqrt{x^2} = x$

2 times the product of $\sqrt{a} \cdot \sqrt{c}$

Perfect square
$\sqrt{36} = 6$

$2(x-6)(x-6) = 2(x-6)^2$

② $5x^2 + 30x + 45$

$5(x^2 + 6x + 9)$

Perfect square
$\sqrt{x^2} = x$

2 times the product of $\sqrt{a} \cdot \sqrt{c}$

Perfect square
$\sqrt{9} = 3$

$5(x+3)(x+3) = 5(x+3)^2$

⑤ $2k^3 - 8k$

Difference

$2k(k^2 - 4)$

Perfect square
$\sqrt{k^2} = k$

Perfect square
$\sqrt{4} = 2$

$2k(k+2)(k-2)$

③ $x^3 - 49x$

$x(x^2 - 49)$

Perfect square
$\sqrt{x^2} = x$

Perfect square
$\sqrt{49} = 7$

Difference

$x(x+7)(x-7)$

⑥ $54k^2 - 24$

$6(9k^2 - 4)$

Perfect square
$\sqrt{9k^2} = 3k$

Perfect square
$\sqrt{4} = 2$

Difference

$6(3k-2)(3k+2)$

⑦ $5k^3 + 100k^2 + 500k$

Perfect Square Trinomial

$5k(k^2 + 20k + 100)$

$5k(k+10)^2$

⑧ $12k^2 - 36k + 27$

Perfect Square Trinomial

$3(4k^2 - 12k + 9)$

$3(2k-3)^2$

⑨ $7a^3b - 7ab^3$

Difference of Squares

$7ab(a^2 - b^2)$

$7ab(a+b)(a-b)$

⑩ $32a^2b^2 + 16ab^2 + 2b^2$

Perfect Square Trinomial

$2b^2(16a^2 + 8a + 1)$

$2b^2(4a+1)^2$

⑪ $4a^3b - 40a^2b^2 + 100ab^3$

Perfect Square Trinomial

$4ab(a^2 - 10ab + 25b^2)$

$4ab(a-5b)^2$

⑫ $4a^4b^3 - a^2b$

Difference of Squares

$a^2b(4a^2 - 1)$

$a^2b(2a-1)(2a+1)$