

Exercises

Factor each polynomial.

1. $24x + 48y$

$$24(x+2y)$$

①

$$\begin{array}{c} x \quad 2y \\ \hline 24 \quad | \quad 24x \quad 48y \end{array}$$



$$\begin{array}{c} q^4 - 18q^3 + 22q \\ \hline q^3 - 18q^2 + 22 \\ q \quad | \quad q^4 \quad -18q^2 \quad 22 \\ \hline \end{array}$$

②

$$\begin{array}{c} (30mp \quad m^2 \quad -6) \\ \hline 2 \quad | \quad 30mp^2 \quad m^2 \quad -6 \\ \hline \end{array}$$

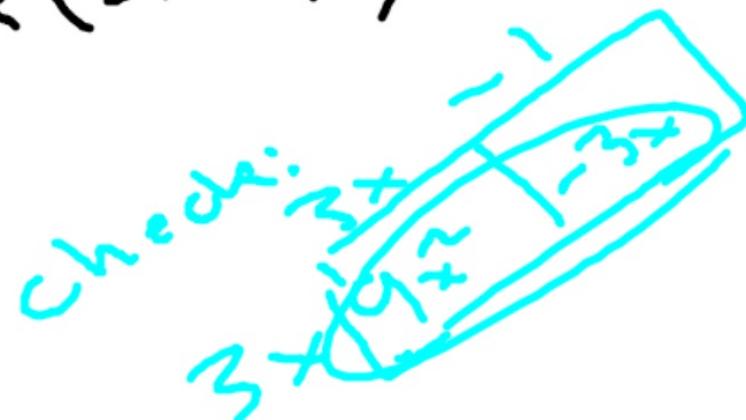
$2(q^3 - 18q^2 + 22)$

$$4. \underline{9x^2 - 3x}$$

$$5. \underline{4m + 6p - 8mp}$$

$$6. \underline{45r^3 - 15r^2}$$

$$3x(3x-1) \quad \textcircled{5} \quad 2(2m+3p-4mp)$$



$$\textcircled{6} \quad 15r^2(3r -$$

$$13. x^2 + 2x + x + 2$$

$$14. 6y^2 - 4y + 3y - 2$$

$$15. 4m^2 + 4mp + 3mp + 3p^2$$

③ "grouping"

$$(x^2+2x) + (x+2)$$

$$\begin{aligned} & x(\cancel{x+2}) + \cancel{(x+2)} \\ & x^a + a = a(x+1) \\ & = (x+2)(x+1) \end{aligned}$$

let $a = x+2$

$$\frac{x}{x} = \frac{3}{3} = \frac{4}{4}$$

checkmate

x	x	x
x	x	x
2	2	2

$$13. x^2 + 2x + x + 2$$

$$14. 6y^2 - 4y + 3y - 2$$

$$15. 4m^2 + \cancel{4mp} + \cancel{3mp} + 3p^2$$

15 $(4m^2 + 4mp) + (3mp + 3p^2)$
 $4m(\underline{m+p}) + 3p(\underline{m+p})$

$$(m+p)(4m+3p)$$

$$(m+p)(4m+3p)$$

Exercises

Solve each equation. Check your solutions.

$$1. \cancel{x}(x + 3) = 0$$

$$\left. \begin{array}{l} x=0 \\ x=-3 \end{array} \right\} x+3=0$$

$$2. \cancel{3m}(m - 4) = 0$$

$$\left. \begin{array}{l} m=0 \\ m=4 \end{array} \right\} \begin{array}{l} ② \\ ③ \end{array}$$

$$3. (r - 3)(r + 2) = 0$$

$$\left. \begin{array}{l} r-3=0 \\ r=3 \end{array} \right\} \left. \begin{array}{l} r+2=0 \\ r=-2 \end{array} \right\} \begin{array}{l} ④ \\ ⑤ \end{array}$$

$$4. 3x(2x - 1) = 0$$

$$\begin{aligned} 3x &= 0 \\ x &= 0 \\ 2x - 1 &= 0 \\ 2x &= 1 \\ x &= \frac{1}{2} \end{aligned}$$

$$5. (4m + 8)(m - 3) = 0$$

$$\begin{aligned} 4m + 8 &= 0 \\ -8 &\quad -8 \\ 4m &= -8 \\ m &= -2 \end{aligned}$$

$$6. 5t^2 = 25t$$

$$\begin{aligned} 5t^2 - 25t &= 0 \\ 5t(t - 5) &= 0 \\ 5t &= 0 \quad (t - 5 = 0) \\ t &= 0 \quad t = 5 \end{aligned}$$

