

4 Rules for Factoring:

1. GCF?

2. 2 terms?
↳ diff. of sq.?

3. 3 terms?

$x^2 + \dots$
↳ factor directly

$5x^2 + \dots$
↳ factor by grouping

4. 4 terms?
use fact. by group.

3) $\frac{x^2}{x} - \frac{6x}{x} + \frac{7x}{7} - \frac{42}{7}$

$$\frac{x(x-6)}{x-6} + \frac{7(x-6)}{x-6}$$

$$(x-6)(x+7)$$

4) $\frac{7x^6}{7x^4} - \frac{28x^5}{7x^4} - \frac{147x^4}{7x^4}$

$$\begin{array}{r} 21 \\ 7 \overline{)147} \\ \underline{-14} \\ 07 \end{array}$$

$7x^4 [x^2 - 4x - 21]$ (diff)

$$\begin{array}{r} 21 \\ 1 21 \\ +3 -7 \end{array}$$

$$7x^4(x+3)(x-7)$$

Factor Completely:

1) $a^2 - 18a + 72$ (sum)

$$(a-6)(a-12)$$

$$\begin{array}{r} 72 \\ 1 72 \\ 2 36 \\ 3 24 \\ 4 18 \\ -6 -12 \\ 8 9 \end{array}$$

2a) $\frac{30r}{6} + \frac{6}{6}$

$$6[5r+1]$$

2b) $y^2 - 49$

$$(y+7)(y-7)$$

5) $9n^2 + 44n - 5$

$$\frac{9n^2}{n} - \frac{1n}{n} + \frac{45n}{5} - \frac{5}{5}$$

$$\begin{array}{r} 45 \\ -1 + 45 \\ 3 15 \\ 5 9 \end{array}$$

$$\frac{n(9n-1)}{9n-1} + \frac{5(9n-1)}{9n-1}$$

$$(9n-1)(n+5)$$

6) $y^2 + 15y - 56$

56

Prime

- 1 56
- 2 28
- 4 14
- 7 8

9) $x^2 + 8xy - 20y^2$

20

$(x - 2y)(x + 10y)$

- 1 20
- 2 +10
- 4 5

7) $\frac{5b^6c^4}{5b^4c^4} + \frac{20b^5c^5}{5b^4c^4} + \frac{30b^4c^7}{5b^4c^4}$

$5b^4c^4 [b^2 + 4bc + 6c^3]$

10) $\frac{18m^2}{6m} + \frac{12m}{6m} - \frac{3mn}{-n} - \frac{2n}{-n}$

$\frac{6m(3m+2)}{3m+2} - \frac{n(3m+2)}{3m+2}$

$(3m+2)(6m-n)$

8) $\frac{-20x^2}{-2} + \frac{38x}{-2} - \frac{12}{-2}$

$-2 [10x^2 - 19x + 6]$

60

- 1 60
- 2 30
- 3 20
- 4 -15
- 5 12
- 6 10

$\frac{10x^2}{2x} - \frac{4x}{2x} - \frac{15x}{-3} + \frac{6}{-3}$

$\frac{2x(5x-2)}{5x-2} - \frac{3(5x-2)}{5x-2}$

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

11a) $9a^2 - 64$

$(3a+8)(3a-8)$

11b) $x^2 - 25y^2$

$(x+5y)(x-5y)$

11c) $x^2 + 25$

Prime

11d) $\frac{4x}{4} + \frac{36}{4}$

$4[x+9]$