## Factor:

1. $x^2 + 4x + 4$

| | |
|---|---|
| 4 | 4 |
| 2·2 | |

$x^2 + 2x + 2x + 4$

$(x^2 + 2x) + (2x + 4)$

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

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

2. $5x^2 + 4x - 12$

| | |
|---|---|
| -60 | 4 |
| -1 60 | |
| -2 30 | |
| -5 12 | |
| -6 10 | |

$5x^2 - 6x + 10x - 12$

$(5x^2 - 6x) + (10x - 12)$

$x(5x - 6) + 2(5x - 6)$

$(x+2)(5x-6)$

3. $x^2 - 21x - 22$

| | |
|---|---|
| -22 | -21 |
| 1 -22 | |
| 2 -11 | |

$x^2 - 22x + 1x - 22$

$(x^2 - 22x) + (x - 22)$

$x(x-22) + 1(x-22)$

$(x+1)(x-22)$

4. $2x^2 - 5x - 7$

| | |
|---|---|
| -14 | -5 |
| 1-14 | |
| 2-7 | |

$2x^2 + 2x - 7x - 7$

$(2x^2 + 2x) + (-7x - 7)$

$2x(x+1) - 7(x+1)$

$(2x-7)(x+1)$

5. $x^2 + 2x - 63$

| | |
|---|---|
| -63 | 2 |
| -1 63 | |
| -7 9 | |

$x^2 - 7x + 9x - 63$

$(x^2 - 7x) + (9x - 63)$

$x(x-7) + 9(x-7)$

$(x+9)(x-7)$

## Solve:

6. $x^2 - 7x - 8 = 0$

| | |
|---|---|
| -8 | -7 |
| 1-8 | |
| 2-4 | |

$x^2 + 1x - 8x - 8 = 0$

$(x^2 + 1x) + (-8x - 8) = 0$

$x(x+1) - 8(x+1) = 0$

$(x-8)(x+1) = 0$

$x - 8 = 0$ $\quad$ $x + 1 = 0$

$+8 \; +8$ $\quad$ $-1 \; -1$

$x = 8$ $\quad$ $x = -1$

7. $12x^2 + 4x - 5 = 0$

| | |
|---|---|
| -60 | 4 |
| 10-6 | |

$12x^2 + 10x - 6x - 5 = 0$

$(12x^2 + 10x) + (-6x - 5) = 0$

$2x(6x + 5) - 1(6x + 5) = 0$

$(2x - 1)(6x + 5) = 0$

$2x - 1 = 0$ $\quad$ $6x + 5 = 0$

$+1 \; +1$ $\quad$ $-5 \; -5$

$\frac{2x}{2} = \frac{1}{2}$ $\quad$ $\frac{6x}{6} = \frac{-5}{6}$

$x = 1/2$ $\quad$ $x = -\frac{5}{6}$

8. $x^2 - 5x + 6 = 0$

| | |
|---|---|
| 6 | -5 |
| -3-2 | |

$x^2 - 3x - 2x + 6$

$(x^2 - 3x) + (-2x + 6) = 0$

$x(x-3) - 2(x-3) = 0$

$(x-2)(x-3) = 0$

$x - 2 = 0$ $\quad$ $x - 3 = 0$

$+2 \; +2$ $\quad$ $+3 \; +3$

$x = 2$ $\quad$ $x = 3$