MORE SOLVING EQUATIONS BY FACTORING

Example 1

Solve $m^2 - 8m - 33 = 0$.

sum -8 product -33

$(m-11)(m+3)=0$ $\frac{-11}{1}$ $\frac{3}{1}$

$m-11=0$ $+11\ +11$

$m=11$

$m+3=0$ $-3\ -3$

$m=-3$

Example 2

Solve $r^2 = 5r + 24$.

$-5r-24\ -5r-24$

$r^2-5r-24=0$

sum -5 product -24

$(r-8)(r+3)=0$ $\frac{-8}{1}$ $\frac{3}{1}$

$r-8=0$ $+8\ +8$

$r=8$

$r+3=0$ $-3\ -3$

$r=-3$

Example 3

LCD = 12

Solve $12\cdot\left(\frac{x^2}{12} - \frac{2x}{3} - 4\right) = 0\cdot 12$

$\cancel{12}\cdot\frac{x^2}{\cancel{12}} - \cancel{12}^{4}\cdot\frac{2x}{3} - 12\cdot 4 = 12\cdot 0$

$x^2 - 8x - 48 = 0$

$(x-12)(x+4) = 0$

s -8 p -48

-12 4

1 1

$x-12=0$ $\quad$ $x+4=0$

$x=12$ $\quad$ $x=-4$

Example 4

LCD = 10

Solve $10\left(\frac{x^2}{5} - \frac{x}{2} - \frac{3}{10}\right) = 0\cdot 10$

$\cancel{10}^{2}\cdot\frac{x^2}{\cancel{5}} - \cancel{10}^{5}\cdot\frac{x}{2} - \cancel{10}\cdot\frac{3}{\cancel{10}} = 10\cdot 0$

$2x^2 - 5x - 3 = 0$

$(x-3)(2x+1) = 0$

s -5 p -6

$\frac{-6}{2}$ $\quad$ $\frac{1}{2}$

$\downarrow$ $\quad$ $\downarrow$

-3 $\quad$ $\frac{1}{2}$

$x-3=0$ $\quad$ $2x+1=0$

$x=3$ $\quad$ $x=-\frac{1}{2}$

Example 5

Solve $h^3 + 2h^2 = 15h$.

$-15h \quad -15h$

$h^3 + 2h^2 - 15h = 0$

$h(h^2 + 2h - 15) = 0$

$h(h-3)(h+5) = 0$

$h = 0 \quad h - 3 = 0 \quad h + 5 = 0$

$h = 0 \quad h = 3 \quad h = -5$

s 2 p -15

$-3 \quad 5$

$1 \quad 1$

Example 6

Solve $7x^2 = 70x - 175$.

$-70x + 175 \quad -70x + 175$

$7x^2 - 70x + 175 = 0$

$7(x^2 - 10x + 25) = 0$

$7(x-5)(x-5) = 0$

$x - 5 = 0$

$x = 5$

s -10 p25

$-5 \quad -5$

$1 \quad 1$

Example 7 FOIL/dist. prop.

Solve $(x + 8)(x + 1) = -12$.

$x^2 + x + 8x + 8 = -12$

$+12 \quad +12$

$x^2 + 9x + 20 = 0$

$(x+4)(x+5) = 0$

S 9 P 20

4 5

1 1

$x+4=0$ $\quad x+5=0$

$\boxed{x=-4}$ $\quad \boxed{x=-5}$

Example 8 FOIL

Solve $(x + 1)(2x + 1) = 28$.

$2x^2 + x + 2x + 1 = 28$

$-28 \quad -28$

$2x^2 + 3x - 27 = 0$

$(2x+9)(x-3) = 0$

S 3 P -54

$\frac{9}{2}$ $\quad \frac{-6}{2}$

$\downarrow$ $\quad \downarrow$

$\frac{9}{2}$ $\quad \frac{-3}{1}$

$2x+9=0$ $\quad x-3=0$

$\boxed{x=-\frac{9}{2}}$ $\quad \boxed{x=3}$