Factoring to Solve Quadratic Equations

Zero-Product Property

For any real numbers a and b, if $ab=0$, then $a=0$ or $b=0$

Example: If $(x+3)(x+2)=0$, then $x+3=0$ and $x+2=0$

Use the Zero-Product Property to solve.

① $(x+8)(x-3)=0$

$x+8=0$ $\quad$ $x-3=0$

$-8\ -8$ $\quad$ $+3\ +3$

$x=-8$ and $x=3$

② $-4m(3m+4)=0$

$\frac{-4m}{-4}=\frac{0}{-4}$ $\quad$ $3m+4=0$

$m=0$ $\quad$ $-4\ -4$

$\frac{3m}{3}=\frac{-4}{3}$

and $m=-\frac{4}{3}$

Solve by factoring.

③ $x^2-5x-14=0$

$(x+2)(x-7)=0$

$x+2=0$ $\quad$ $x-7=0$

$-2\ -2$ $\quad$ $+7\ +7$

$x=-2$ or $x=7$

④ $y^2+14y=-49$

$+49\ \ +49$

$y^2+14y+49=0$

$(y+7)(y+7)=0$

$y+7=0$

$-7\ -7$

$y=-7$

⑤ $5b^2=20b$

$-20b\ \ -20b$

$5b^2-20b=0$

$5b(b-4)=0$

$\frac{5b}{5}=\frac{0}{5}$ $\quad$ $b-4=0$

$+4\ +4$

$b=0$ and $b=4$