Solving Equations By Factoring

1. Solve each equation by factoring.

a) $x^2 - 6x + 5 = 0$

$x \quad x$ $\quad$ $1 \cdot 5$

$(x-1)(x-5)=0$

$x-1=0$ $\quad$ $x-5=0$

$+1 \quad +1$ $\quad$ $+5 \quad +5$

$\boxed{x=1}$ $\quad$ $\boxed{x=5}$

b) $-15x^2 + 75x = 0$

$\frac{-15x^2}{-15x} \quad \frac{75x}{-15x}$

GCF $= -15x$

$-15x(1x^1 - 5) = 0$

$\frac{-15x}{-15} = \frac{0}{-15}$ $\quad$ $x-5=0$

$+5 \quad +5$

$\boxed{x=0}$ $\quad$ $\boxed{x=5}$

c) $2m^2 + 3m - 10m - 15 = 0$

$m \quad m \quad -5 \quad -5$

GCF $= m$ $\quad$ GCF $= -5$

$\frac{m(2m+3)}{2m+3} - \frac{5(2m+3)}{2m+3} = 0$

GCF $= 2m+3$

$(2m+3)(m-5)=0$

$2m+3=0$ $\quad$ $m-5=0$

$-3 \quad -3$ $\quad$ $+5 \quad +5$

$\frac{2m}{2} = \frac{-3}{2}$ $\quad$ $\boxed{m=5}$

$\boxed{m=-1.5}$

d) $6x^3 - 33x^2 - 120x = 0$

$\frac{6x^3}{3x} \quad \frac{33x^2}{3x} \quad \frac{120x}{3x}$

GCF $= 3x$

$3x(2x^2 - 11x - 40) = 0$

$1 \cdot 2$ $\quad$ $1 \cdot 40$ $\quad$ $4 \cdot 10$

$2 \cdot 20$ $\quad$ $5 \cdot 8$

$3x(2x+5)(1x-8)=0$

$5x$

$16x$

$\frac{3x}{3} = \frac{0}{3}$ $\quad$ $2x+5=0$ $\quad$ $x-8=0$

$-5 \quad -5$ $\quad$ $+8 \quad +8$

$\boxed{x=0}$ $\quad$ $\frac{2x}{2} = \frac{-5}{2}$ $\quad$ $\boxed{x=8}$

$\boxed{x=-2.5}$

e) $-x^2 + 16x = -36$

$+x^2 - 16x \quad + x^2 - 16x$

$0 = x^2 - 16x - 36$

$x^2 - 16x - 36 = 0$

$1 \cdot 36$

$\boxed{2 \cdot 18}$

$3 \cdot 12$

$4 \cdot 9$

$6 \cdot 6$

f) $x^2 = 7x - 12$

$-7x + 12 \quad -7x + 12$

$x^2 - 7x + 12 = 0$

$1 \cdot 12$

$2 \cdot 6$

$\boxed{3 \cdot 4}$

$(x-3)(x-4)=0$

$x-3=0$ $\quad$ $x-4=0$

$+3 \quad +3$ $\quad$ $+4 \quad +4$

$(x + 2)(x - 18) = 0$

$x + 2 = 0$
$-2 \quad -2$
$\boxed{x = -2}$

$x - 18 = 0$
$+18 \quad +18$
$\boxed{x = 18}$

$\boxed{x = 3}$

$\boxed{x = 4}$

g) $2p^3 = 162p$

$-162p \quad -162p$

$\frac{2p^3}{2p} - \frac{162p}{2p} = 0$

GCF = 2p

$2p(p^2 - 81) = 0$

p p 9 9

$2p(p + 9)(p - 9) = 0$

$\frac{2p}{2} = \frac{0}{2}$
$\boxed{p = 0}$

$p + 9 = 0$
$-9 \quad -9$
$\boxed{p = -9}$

$p - 9 = 0$
$+9 \quad +9$
$\boxed{p = 9}$