6. $2(x+3) = 3(x+2y-1)$

7. $\frac{x-1}{y+2} = 3$

11. $\frac{xy}{x+1} = 3$

$xy = 3(x+1)$

$xy = 3x+3$

$xy - 3x = 3$

$x(y-3) = 3$

$x = \frac{3}{y-3}$

12. $y-3 = \frac{x}{2x+1}$

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

$2xy + y - 6x - 3 = x$

$y - 3 = x - 2xy + 6x$

$y - 3 = 7x - 2xy$

$y - 3 = x(7-2y)$

$\frac{y-3}{7-2y} = x$

$2xy - 6x - x = -y + 3$

$2xy - 7x = -y + 3$

$x(2y-7) = -y+3$

$x = \frac{-y+3}{2y-7}$

$= \frac{3-y}{2y-7}$

13. $z = x^2y + 3$

$z - 3 = x^2y$

$\frac{z-3}{y} = x^2$

$\pm\sqrt{\frac{z-3}{y}} = x$

2. Solve. Factor and use the quadratic formula where needed.

a) $y^3+y^2+2y+2=0$ b) $16x^2-36=0$ c) $15x^2+3x-12=0$

d) $2x^4-18x^2=0$ e) $x^3-3x^2+2x=0$ f) $2x^4-20x^3+48x^2=0$ *Check Solns*

g) $2x^2+13x+15=0$

$(2x+3)(x+5)=0$

$\downarrow$

$\therefore x=-\frac{3}{2}$ or $x=-5$

h) $x^3-19=0$

i) $-4x^3+10x^2-2x=0$

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

$a=2 \quad b=-5 \quad c=1$

$x=\frac{-(-5)\pm\sqrt{(-5)^2-4(2)(1)}}{2(2)}$

$=\frac{5\pm\sqrt{25-8}}{4}$

$x=\frac{5+\sqrt{17}}{4}$ or $x=\frac{5-\sqrt{17}}{4}$

$\doteq 2.280$ $\doteq 0.219$

$\therefore x=0$ or $x\doteq 2.28$ or $x\doteq 0.22$

j) $x(x^2-x-2)=14-x(x+2)$

$x^3-x^2-2x=14-x^2-2x$

$x^3-x^2-2x-14+x^2+2x=0$

$x^3-14=0$

$x^3=14$

$x=\sqrt[3]{14}$

$\doteq 2.410$

$\doteq 2.41$

k) $-4x^2+36=-x^3+9x$

2a) $y=-1$ b) $x=\frac{-3}{2},\frac{3}{2}$ c) $x=\frac{4}{5},-1$ d) $x=0,-3,3$ e) $x=0,1,2$ f) $x=0,6,4$

g) $x=\frac{-3}{2},-5$ h) $x\doteq 2.67$ i) $x=0,\ x\doteq 2.28,\ x\doteq 0.22$ j) $x\doteq 2.41$ k) $x=-3,3,4$

4. Rearrange each formula.

a) Make $x$ the subject of $5+8y+4x=33$

b) Make $b$ the subject of $A=\frac{h(a+b)}{2}$

$2A = h(a+b)$

$\frac{2A}{h} = a+b$

$\frac{2A}{h} - a = b$

*Check Solns*

c) Make $v$ the subject of $I = mv - mu$

d) Make $x$ the subject of $\frac{x+3y}{z-2x} = 3$

$x+3y = 3(z-2x)$

$x+3y = 3z-6x$

$x+6x = 3z-3y$

$7x = 3z-3y$

$x = \frac{3z-3y}{7}$

e) Make $x$ the subject of $(x+1)^2 = 4yz+6$

**4**a) $x=-2y+7$ b) $b=\frac{2A}{h}-a$ c) $v=\frac{I}{m}+u$ d) $x=\frac{3z-3y}{7}$ e) $x=\sqrt{4yz+6}-1$