1. Break the following brackets.

a) $5(x-4) \rightarrow 5x-20$

b) $-2(x-5) \rightarrow -2x+10$

c) $-3(2x+1) \rightarrow -6x-3$

d) $5(3x+2) \rightarrow 15x+10$

2. Simplify the following.

a) $6-2(y+1) \rightarrow 6-2y-2 \rightarrow 4-2y$

b) $5-(n-1) \rightarrow 5-n+1 \rightarrow 6-n$

c) $10+4(x-2) \rightarrow 10+4x-8 \rightarrow 2+4x$

d) $4+(8w-1) \rightarrow 4+8w-1 \rightarrow 3+8w$

e) $3(x-2)-2(x+1) \rightarrow 3x-6-2x-2$

$\rightarrow x-8$

3. Solve the following equations

a)
$$3(y-1)=15$$
$$3y-3=15$$
$$3y=12$$
$$y=4$$

b)
$$5(u+1)+3=18$$
$$5u+5+3=18$$
$$5u+8=18$$
$$5u=10$$
$$u=2$$

c)
$$5(x-1)=3(x+1)$$
$$5x-5=3x+3$$
$$2x=8$$
$$x=4$$

d)
$$5(k-3)=3(k-1)$$
$$5k-15=3k-3$$
$$2k=12$$
$$k=6$$

e)
$$5-2(x+1)=x$$
$$5-2x-2=x$$
$$3=3x$$
$$1=x$$

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

g)
$$6(x-1)-5=4-(x+1)$$
$$6x-6-5=4-x-1$$
$$6x-11=3-x$$
$$7x=14$$
$$x=2$$

4. Multiply out using FOIL

a) $(x+3)(x+2) \rightarrow x^2+5x+6$

b) $(m+1)(m+1) \rightarrow m^2+2m+1$

c) $(u-5)(u-6) \rightarrow u^2-11u+30$

d) $(z-4)(z+5) \rightarrow z^2+z-20$

e) $(2c-4)(3c-2) \rightarrow 6c^2-16c+8$

5. Using multiplication tables

a) $(x+2)(x^2-3x+1) \rightarrow x^3-x^2-5x+2$

b) $(x-3)(x^2+x-3) \rightarrow x^3-2x^2-6x+9$

c) $(x-1)(x^2-2x-4) \rightarrow x^3-3x^2-2x+4$

6. Multiply out these brackets

a) $(p+1)^2 \rightarrow p^2+2p+1$

b) $(m-2)^2 \rightarrow m^2-4m+4$

c) $(m-n)^2 \rightarrow m^2-2mn+n^2$

d) $(2x-3)^2 \rightarrow 4x^2-12x+9$

e) $(x-3y)^2 \rightarrow x^2-6xy+9y^2$

f) $\left(x-\frac{1}{x}\right)^2 \rightarrow x^2-2-\frac{1}{x^2}$

7. Solve these equations

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

b)
$$(t-5)^2=(t-1)^2$$
$$t^2-10t+25=t^2-2t+1$$
$$-10t+25=-2t+1$$
$$24=8t$$
$$3=t$$

c)
$$(4p+1)(p-1)=(2p-1)^2$$
$$4p^2-3p-1=4p^2-4p+1$$
$$-3p-1=-4p+1$$
$$p=2$$