Factorising

1 Factorise the following expressions:

a) $8x + 20$ b) $3x + 6$ c) $16 + 8x$ d) $8 - 12x$

e) $x^2 - 5x$ f) $4x^2 + 16x$ g) $8x^2 - 20x$ h) $9x^2 - 15x$

2 Factorise the following expressions:

a) $x^2 + 8x + 15$ b) $x^2 + 10x + 24$ c) $x^2 + 9x + 8$ d) $x^2 + 15x + 36$

e) $x^2 + 2x - 3$ f) $x^2 + 2x - 8$ g) $x^2 - 2x - 3$ h) $x^2 + 7x - 18$

i) $x^2 - 12x + 35$ j) $x^2 - 11x + 10$ k) $x^2 - 13x + 22$ l) $x^2 + 12x + 27$

3 Factorise the following expressions:

a) $x^2 - 144$ b) $x^2 - 36$ c) $x^2 - 1$ d) $x^2 - 121$

e) $9x^2 - 1$ f) $16x^2 - 9$ g) $49x^2 - 1$ h) $25x^2 - 16$

4 Factorise the following expressions:

a) $2x^2 + 11x + 5$ b) $3x^2 + 19x + 6$ c) $3x^2 + 17x - 6$ d) $6x^2 + 7x + 2$

e) $7x^2 - 6x - 1$ f) $12x^2 + 7x + 1$ g) $8x^2 + 6x + 1$ h) $8x^2 - 6x + 1$

1. Single Brackets

a) $8x+20 = 4(2x+5)$
b) $3x+6 = 3(x+2)$
c) $16+8x = 8(2+x)$
d) $8-12x = 4(2-3x)$
e) $x^2-5x = x(x-5)$
f) $4x^2+16x = 4x(x+4)$
g) $8x^2-20x = 4x(2x-5)$
h) $9x^2-15x = 3x(3x-5)$

2. Double Brackets

a) $x^2+8x+15 = (x+3)(x+5)$
b) $x^2+10x+24 = (x+6)(x+4)$
c) $x^2+9x+8 = (x+8)(x+1)$
d) ~~$x^2+2x-3 = (x+3)(x-1)$~~ $x^2+15x+36 = (x+9)(x+4)$
e) $x^2+2x-3 = (x+3)(x-1)$
f) $x^2+2x-8 = (x+4)(x-2)$
g) $x^2-2x-3 = (x-3)(x+1)$
h) $x^2+7x-18 = (x+9)(x-2)$
i) $x^2-12x+35 = (x-7)(x-5)$
j) $x^2-11x+10 = (x-10)(x-1)$
k) $x^2-13x+22 = (x-11)(x-2)$
l) $x^2+12x+27 = (x+3)(x+9)$

3. Difference of 2 Squares.

a) $x^2-144 = (x+12)(x-12)$
b) $x^2-36 = (x+6)(x-6)$
c) $x^2-1 = (x+1)(x-1)$
d) $x^2-121 = (x+11)(x-11)$
e) $9x^2-1 = (3x+1)(3x-1)$
f) $16x^2-9 = (4x+3)(4x-3)$
g) $49x^2-1 = (7x+1)(7x-1)$
h) $25x^2-16 = (5x+4)(5x-4)$

4. Harder Double Brackets

a) $2x^2+11x+5$ $\times 10 \quad +11$.

$2x^2+10x+x+5$

$2x(x+5)+1(x+5)$

$(2x+1)(x+5)$

b) $3x^2+19x+6$ $\times 18 \quad +19$

$3x^2+18x+x+6$

$3x(x+6)+1(x+6)$

$(3x+1)(x+6)$

c) $3x^2+17x-6$ $\times -18 \quad +17$

$3x^2+18x-x-6$

$3x(x+6)-1(x+6)$

$(3x-1)(x+6)$

d) $6x^2+7x+2$ $\times 12 \quad +7$

$6x^2+3x+4x+2$

$3x(2x+1)+2(2x+1)$

$(3x+2)(2x+1)$

e) $7x^2-6x-1$ $\times -7 \quad +-6$

$7x^2-7x+x-1$

$7x(x-1)+1(x-1)$

$(7x+1)(x-1)$

f) $12x^2+7x+1$ $\times 12 \quad +7$

$12x^2+3x+4x+1$

$3x(4x+1)+1(4x+1)$

$(3x+1)(4x+1)$

g) $8x^2+6x+1$ $\times 8 \quad +6$

$8x^2+2x+4x+1$

$2x(4x+1)+1(4x+1)$

$(2x+1)(4x+1)$

h) $8x^2-6x+1$ $\times 8 \quad +6$

$8x^2-4x-2x+1$

$4x(2x-1)-1(2x+1)$

$(4x-1)(2x+1)$