

Answers

Year 9 Higher – Expanding Brackets

1. Expand the single brackets

a) $5(y + 3) = 5y + 15$

b) $3(w - 6) = 3w - 18$

c) $a(b + 7) = ab + 7a$

d) $-5(2q - 3) = -10q + 15$

e) $4(5t + 6) = 20t + 24$

f) $2d(5e + 2f) = 10de + 4df$

g) $2y(3y - 2) = 6y^2 - 4y$

h) $3g^2(g^2 + 5g) = 3g^4 + 15g^3$

i) $8rt(3s - 5st + 7t^2) =$
 $= 24rst - 40rst^2 + 56rt^3$

j) $5abc(abc^2 + 9ab^4 - 3abc + 23b^5c^{-3}) =$
 $= 5a^2b^2c^3 + 45a^2b^5c - 15a^2b^2c^2$
 $+ 115ab^6c^{-2}$



1. Expand and simplify

a) $5(y - 7) + 2y + 3 =$
 $= 5y - 35 + 2y + 3$
 $= 7y - 32$

b) $7 - 6(2g + 7) = 7 - 12g - 42$
 $= -12g - 35$

Expand each bracket first and then simplify these expressions:

$$(a) \quad 6(4x-3) + 3(4x-1)$$

$$= 24x - 18 + 12x - 3$$

$$= 36x - 21$$

$$(b) \quad 5(5z+12) + 3(5z-2)$$

$$= 25z + 60 + 15z - 6$$

$$= 40z + 54$$

$$(c) \quad y(5y+6) - y(y-5)$$

$$= 5y^2 + 6y - y^2 + 5y$$

$$= 4y^2 + 11y$$

$$(d) \quad r(5r+p) + 2r(r+p)$$

$$= 5r^2 + rp + 2r^2 + 2rp$$

$$= 7r^2 + 3rp$$

$$(e) \quad 2s(2t+p) + 2t(s+p)$$

$$= 4st + 2sp + 2st + 2pt$$

$$= 6st + 2sp + 2pt$$

$$(f) \quad 4a(3b+p) - 2a(a-p)$$

$$= 12ab + 4ap - 2a^2 + 2ap$$

$$= 12ab + 6ap - 2a^2$$

Expand and simplify

$$\begin{aligned} \text{a) } (h+5)(h+8) \\ &= h^2 + 8h + 5h + 40 \\ &= h^2 + 13h + 40 \end{aligned}$$

$$\begin{aligned} \text{b) } (g-7)(g-3) &= g^2 - 3g - 7g + 21 \\ &= g^2 - 10g + 21 \end{aligned}$$

$$\begin{aligned} \text{c) } (b-4)(b+11) \\ &= b^2 + 11b - 4b - 44 \\ &= b^2 + 7b - 44 \end{aligned}$$

$$\begin{aligned} \text{d) } (2y+3)(2y-5) &= 4y^2 - 10y + 6y - 15 \\ &= 4y^2 - 4y - 15 \end{aligned}$$

$$\begin{aligned} \text{e) } (5j-4)(2j+11) \\ &= 10j^2 + 55j - 8j - 44 \\ &= 10j^2 + 47j - 44 \end{aligned}$$

$$\text{f) } (a+b)(c+d) = ac + ad + bc + bd$$

$$\begin{aligned} \text{g) } (4p-3)^2 &= (4p-3)(4p-3) \\ &= 16p^2 - 12p - 12p + 9 \\ &= 16p^2 - 24p + 9 \end{aligned}$$

$$\begin{aligned} \text{h) } 5(2a+b)(a-6b) \\ &= 5(2a^2 - 12ab + ab - 6b^2) \\ &= 5(2a^2 - 11ab - 6b^2) \\ &= 10a^2 - 55ab - 30b^2 \end{aligned}$$

$$\begin{aligned} \text{i) } (y+1)(y+3)(y-2) \\ (y+1)(y+3) &= y^2 + 3y + y + 3 \\ &= y^2 + 4y + 3 \\ (y+1)(y+3)(y-2) &= (y^2 + 4y + 3)(y-2) \\ &= y^3 + 4y^2 + 3y - 2y^2 - 8y - 6 \\ &= y^3 + 2y^2 - 5y - 6 \end{aligned}$$

$$\begin{aligned} \text{j) } (p+2)(2p-3)(p-1) \\ (p+2)(2p-3) &= 2p^2 - 3p + 4p - 6 \\ &= 2p^2 + p - 6 \\ (p+2)(2p-3)(p-1) &= (2p^2 + p - 6)(p-1) \\ &= 2p^3 + p^2 - 6p - 2p^2 - p + 6 \\ &= 2p^3 - p^2 - 7p + 6 \end{aligned}$$

$$\begin{aligned} \text{k) } (b+2)^2(b-1) &= (b+2)(b+2)(b-1) \\ (b+2)(b+2) &= b^2 + 2b + 2b + 4 \\ &= b^2 + 4b + 4 \\ (b+2)^2(b-1) &= (b^2 + 4b + 4)(b-1) \\ &= b^3 + 4b^2 + 4b - b^2 - 4b - 4 \\ &= b^3 + 3b^2 - 4 \end{aligned}$$

$$\begin{aligned} \text{l) } (2b-5)^3 &= (2b-5)(2b-5)(2b-5) \\ (2b-5)(2b-5) &= 4b^2 - 10b - 10b + 25 \\ &= 4b^2 - 20b + 25 \\ (2b-5)^3 &= (4b^2 - 20b + 25)(2b-5) \\ &= 8b^3 - 40b^2 + 50b - 20b^2 \\ &\quad + 100b - 125 \\ &= 8b^3 - 60b^2 + 150b - 125 \end{aligned}$$