EXPANDING SINGLE BRACKETS

Task 1 – For each of the following, expand and fully simplify.

1) $5(x+2) = \mathbf{5x+10}$

2) $6(y+3) = \mathbf{6y+18}$

3) $2(b+7) = \mathbf{2b+14}$

4) $4(j-1) = \mathbf{4j-4}$

5) $3(x-4) = \mathbf{3x-12}$

6) $2(g-5) = \mathbf{2g-10}$

7) $4(a^2+3) = \mathbf{4a^2+12}$

8) $a(5a+3) = \mathbf{5a^2+3a}$

9) $2b(b-8) = \mathbf{2b^2-16b}$

10) $h(7-h) = \mathbf{7h-h^2}$

11) $m(m+n) = \mathbf{m^2+mn}$

12) $b^6(b-8) = \mathbf{b^7-8b^6}$

13) $-2l(4l-7) = \mathbf{-8l^2+14l}$

14) $2u(7u-8) = \mathbf{14u^2-16u}$

15) $9w^2(w-y) = \mathbf{9w^3-9w^2y}$

16) $q^3(4-q) = \mathbf{4q^3-q^4}$

17) $-10j(5-3j) = \mathbf{-50j+30j^2}$

18) $10ef^2(4e^2f-5f) = \mathbf{40e^3f^3-50ef^3}$

19) $4ab(2a^2b+5) = \mathbf{8a^3b^2+20ab}$

20) $3h^2i^3(4hi^4-8h) = \mathbf{12h^3i^7-24h^3i^3}$

21) $6m^3n^4(4m^2n^5-10n^6) = \mathbf{24m^5n^9-60m^3n^{10}}$

22) $12e^2f^5(e^3f^4+12ef) = \mathbf{12e^5f^9+144e^3f^6}$

23) $10y^4z^5(2yz-15y^3z^6) = \mathbf{20y^5z^6-150y^7z^{11}}$

24) $10p^2q^4r^7(2p^8r^2+q^5) = \mathbf{20p^{10}q^4r^9+10p^2q^9r^7}$

25) $12x^4y^7z^3(7x^5y^8z^2-10x^3y^4z^{10})$

$= \mathbf{84x^9y^{15}z^5-120x^7y^{11}z^{13}}$

Task 2 – For each of the following, expand and fully simplify.

26) $4(a+7)+3(a+2)$

$= 4a+28+3a+6$

$= \mathbf{7a+34}$

27) $7(p+3)+8(p+1)$

$= 7p+21+8p+8$

$= \mathbf{15p+29}$

28) $3(w+4)+6(w+10)$

$= 3w+12+6w+60$

$= \mathbf{9w+72}$

29) $5(y+7)-3(y+4)$

$= 5y+35-3y-12$

$= \mathbf{2y+23}$

30) $4(g-3)+5(g-7)$

$= 4g-12+5g-35$

$= \mathbf{9g-47}$

31) $4(k-6)-3(k-1)$

$= 4k-24-3k+3$

$= \mathbf{k-21}$

32) $6(m-3)-4(m+2)$

$= 6m-18-4m-8$

$= \mathbf{2m-26}$

33) $d(d+2)-d(d+4)$

$= d^2+2d-d^2-4d$

$= \mathbf{-2d}$

34) $8e(e^2+4)+7e(e^2-9)$

$= 8e^3+32e+7e^3-63e$

$= \mathbf{15e^3-31e}$

35) $-2f(f^2-10)+4f(12-f^3)$

$= -2f^3+20f+48f-4f^4$

$= \mathbf{-4f^4-2f^3+68f}$

36) $2xy(x+5)-3xy(x+4)$

$= 2x^2y+10xy-3x^2y-12xy$

$= \mathbf{-x^2y-2xy}$

37) $9c^2d(c+4d)-2c^2d(3d-c)$

$= 9c^3d+36c^2d^2-6c^2d^2+2c^3d$

$= \mathbf{11c^3d+30c^2d^2}$

38) $4x^2y^2(x+7)-2x^2y^2(x-3)$

$= 4x^3y^2+28x^2y^2-2x^3y^2+6x^2y^2$

$= \mathbf{2x^3y^2+34x^2y^2}$

39) $c^6d^3(cd-4)+7c^6d^3(5cd-8)$

$= c^7d^4-4c^6d^3+35c^7d^4-56c^6d^3$

$= \mathbf{36c^7d^4-60c^6d^3}$

Challenge

40) Given that a rectangle has a length that is 3 units longer than its width, show that

$$Area = x^2+3x$$

$$Width: x$$
$$Length: x+3$$

$$Area = x(x+3)$$

$$= x^2+3x \checkmark$$

41) Given that a triangle has a base that is 4 units less than its height, show that

$$Area = \frac{1}{2}x^2-2x$$

$$Height: x$$
$$Base: x-4$$

$$Area = \frac{1}{2}\times base \times height$$

$$= \frac{1}{2}x(x-4)$$

$$= \frac{1}{2}x^2-2x \ \checkmark$$