EXPANDING SINGLE BRACKET

Answer all of these questions. Remember to show your working out in all questions.

MAIN QUESTIONS

1. Expand $2x(x^2 + 3x)$ | $2x^3 + 6x^2$

2. Expand $3y(2y^2 - 4)$ | $6y^3 - 12y$

3. Expand $-4a(a^3 + 2a)$ | $-4a^4 - 8a^2$

4. Expand $5b(3b^2 - b + 2)$ | $15b^3 - 5b^2 + 10b$

5. Expand $-2c(4c^3 - 3c^2)$ | $-8c^4 + 6c^3$

6. Expand $7d(d^4 + 2d^2 - 1)$ | $7d^5 + 14d^3 - 7d$

7. Expand $-3e(5e^3 - 2e + 4)$ | $-15e^4 + 6e^2 - 12e$

8. Expand $4f(2f^5 - 3f^3 + f)$ | $8f^6 - 12f^4 + 4f^2$

9. Expand $-5g(g^4 + 4g^2 - 2g)$ | $-5g^5 - 20g^3 + 10g^2$

10. Expand $6h(3h^3 - 2h^2 + 5h - 1)$ | $18h^4 - 12h^3 + 30h^2 - 6h$

11. Expand $-7j(4j^4 - j^3 + 3j)$ | $-28j^5 + 7j^4 - 21j^2$

12. Expand $8k(2k^5 + 3k^3 - 4k^2 + k)$ | $16k^6 + 24k^4 - 32k^3 + 8k^2$

13. Expand $-9m(m^4 - 2m^3 + 5m^2)$ | $-9m^5 + 18m^4 - 45m^3$

14. Expand $10n(3n^6 - n^4 + 2n^2 - 1)$ | $30n^7 - 10n^5 + 20n^3 - 10n$

15. Expand $-11p(5p^3 - 4p^2 + 3p - 2)$ | $-55p^4 + 44p^3 - 33p^2 + 22p$

16. Expand $12q(2q^7 + q^5 - 3q^3 + q)$ | $24q^8 + 12q^6 - 36q^4 + 12q^2$

17. Expand $-13r(r^6 - 2r^4 + 4r^2 - 1)$ | $-13r^7 + 26r^5 - 52r^3 + 13r$

18. Expand $14s(4s^5 - 3s^3 + 2s^2 - s)$ | $56s^6 - 42s^4 + 28s^3 - 14s^2$

19. Expand $-15t(5t^4 - 2t^3 + t^2 - 3t)$ | $-75t^5 + 30t^4 - 15t^3 + 45t^2$

20. Expand $16u(3u^8 - u^6 + 4u^4 - 2u^2)$ | $48u^9 - 16u^7 + 64u^5 - 32u^3$

21. Expand $-17v(2v^7 + 5v^5 - 3v^3 + v)$ | $-34v^8 - 85v^6 + 51v^4 - 17v^2$

22. Expand $18w(4w^6 - 2w^4 + 6w^2 - 1)$ | $72w^7 - 36w^5 + 108w^3 - 18w$

23. Expand $-19x(3x^5 + x^3 - 4x^2 + 2x)$ | $-57x^6 - 19x^4 + 76x^3 - 38x^2$

24. Expand $20y(5y^4 - 3y^3 + 2y^2 - y + 1)$ | $100y^5 - 60y^4 + 40y^3 - 20y^2 + 20y$

25. Expand $-21z(4z^6 - 2z^4 + 5z^3 - 3z)$ | $-84z^7 + 42z^5 - 105z^4 + 63z^2$

26. Expand $22a(3a^7 + 2a^5 - a^3 + 4a)$ | $66a^8 + 44a^6 - 22a^4 + 88a^2$

27. Expand $-23b(5b^4 - 4b^3 + 3b^2 - 2b + 1)$ | $-115b^5 + 92b^4 - 69b^3 + 46b^2 - 23b$

28. Expand $24c(2c^8 + 3c^6 - c^4 + 5c^2)$ | $48c^9 + 72c^7 - 24c^5 + 120c^3$

29. Expand $-25d(4d^5 - 3d^4 + 2d^3 - d^2 + d)$ | $-100d^6 + 75d^5 - 50d^4 + 25d^3 - 25d^2$

30. Expand $26e(3e^7 + 5e^5 - 2e^3 + 4e - 1)$ | $78e^8 + 130e^6 - 52e^4 + 104e^2 - 26e$

MASTER QUESTIONS

M1. A square's side length is increased by x metres. If the original side was 3x metres, find the expanded expression for the new area. | $9x^2 + 6x^3 + x^4$

M2. A rectangular garden has length 4y metres and width $(y^2 + 2)$ metres. Calculate the expanded area expression. | $4y^3 + 8y$

M3. The volume of a cube is given by $(\text{side length})^3$. If the side is $(2z + 1)$ metres, expand to find the volume expression. | $8z^3 + 12z^2 + 6z + 1$

M4. A triangle's area is ½ × base × height. If base = 3a and height = $(a^2 + 2a)$, find the expanded area expression. | $1.5a^3 + 3a^2$

M5. The cost of x items is given by $x(2x^2 + 5x - 3)$ pounds. Expand this expression. | $2x^3 + 5x^2 - 3x$

M6. A car travels at speed $(3v + 2)$ mph for (v^2) hours. Expand the distance expression. | $3v^3 + 2v^2$

M7. The perimeter of a regular pentagon is 5 times the side length. If side = $(4w^2 - w)$, expand the perimeter expression. | $20w^2 - 5w$

M8. A cylinder's surface area is $2\pi r(r + h)$. If $r = 2x$ and $h = (x^2 + 3)$, expand the expression (ignoring π).

$4x^3 + 14x^2$

M9. The profit from selling n items is $n(5n^2 - 3n + 2)$ pounds. Expand this profit expression.

$5n^3 - 3n^2 + 2n$

M10. A room's floor area is length × width. If length $= (3y + 1)$ and width $= (2y^2 - y)$, expand the area expression.

$6y^3 - y^2 - y$