EXPANSION

1. Multiply: $(2x + 6)(3x + 4)$.
2. Find $(7x - 3)(3x - 3)$ by inspection.
3. Solve:
   i. $(2x + 3y)^2$
   ii. $\left(\frac{4x}{5} + \frac{y}{3}\right)^2$
   iii. $(3x - 4y)^2$
   iv. $(a^2 - b^2)^2$
   v. $(x + 3)(x - 3)$
   vi. $(5x + 7y)(5x - 7y)$
   vii. $(a - b - c)(a - b + c)$
   viii. $(1 + x)(1 + x^2)(1 - x)$
   ix. $(2x + 4y + z)^2$
   x. $(a + b - 2c)^2$
   xi. $(-3a + b - c)^2$
   xii. $(a^2 + b^2 + c^2)^2$
   xiii. $(2x + 3y)^3$
   xiv. $(4x - 5y)^3$
   xv. $\left(x + \frac{1}{x}\right)^3$
   xvi. $\left(2x - \frac{1}{3y}\right)^3$
4. Evaluate each of the following using identities:
   i. 105×95
   ii. 204×204
5. 96×96
   iii. $165 \times 165 - 135 \times 135$
6. Find the value of
   i. $a^2 + b^2$ when $a + b = 7$ and $ab = 12$
   ii. $x^2 + \frac{1}{x^2}$ and $x^4 + \frac{1}{x^4}$ if $x + \frac{1}{x} = 4$
7. if $a^2 + \frac{1}{a^2} = 7$, find the values of
   i. $\left(a^2 + \frac{1}{a^2}\right)^2$
   ii. $\left(a^2 - \frac{1}{a^2}\right)$

    iii. $\left(a - \frac{1}{a}\right)$

8. Find the value of $a^2 + b^2 c^2 = 13$ and $ab + bc + ca = 27$.

9. If $a^2 + b^2 c^2 = 5$ and $ab + bc + ca = 10$, find the value of $a + b + c$

10. Find the value of $27 a^3 + 108a^2b + 144ab^2 + 64b^3$ if $a = 2$, $b = 3$

11. Find the value of
    i. $X^3 + y^3$ if $x + y = 6$ and $xy = 5$;
    ii. $27x^3 + 8y^3$ if $3x + 2y = 14$ and $xy = 8$.

12. Find the value of $p^3 - q^3$ if $p - q = -8$, $pq = -12$

13. Find the value of
    i. $x^3 + \frac{1}{x^3}$
    ii. $x + x + \frac{1}{x} = -1$
    iii. $x - \frac{1}{x} = \sqrt{5}$
    iv. $= -1$
    v. $x - \frac{1}{x} = \sqrt{5}$

14. find the value of $x^3 - \frac{1}{x^3}$ if
    i. $x - \frac{1}{x} = 6$
    ii. $x + \frac{1}{x} = \sqrt{29}$

15. if $\left(x + \frac{1}{x}\right)^2 = 3$, show that $x^3 - \frac{1}{x^3} = 0$

16. if $a + b + c = 0$, show that $a^3 + b^3 + c^3 = 3abc$.

17. Find the value of $(55)^3 - (25)^3 - (30)^3$

18. If $x3 + y3 + z3 = 3xyz$ and $x + y + z = 0$, find the value of $\frac{(x+y)^2}{xy} + \frac{(y+z)^2}{yz} + \frac{(z+x)^2}{zx}$.