Exponents & Powers

1) Write the following using exponential notation:
   (a) square of 5    (b) fifth power of two    (c) cube of 9    (d) seventh power of 11

2) Express the following in the exponential form:
   (a) 27    (b) 125    (c) 625    (d) 512    (e) 3125    (f) 729
   (g) 1296    (h) 10000    (i) \(-\frac{32}{243}\)    (j) \(\frac{81}{2401}\)    (k) \(-\frac{2187}{128}\)

3) What power of 4 is 256?

4) If \(a = 3\) and \(b = 2\), then find the value of the following:
   (a) \(a^b - b^a\)    (b) \((ba)^b\)    (c) \((ab)^a + b^a\)

5) Simplify and express in the exponential form:
   (a) \(5^2 \times 4^2\)    (b) \(7^3 \times 3^3\)    (c) \(8^5 \times 3^5\)    (d) \(2^7 \times 9^7\)

6) Evaluate:
   (a) \((-\frac{1}{2})^3 \times 3^2 \times (\frac{3}{4})^2\)    (b) \([\left(\frac{1}{2}\right)^2 - \left(\frac{1}{4}\right)^3]^3\) \times 2^3\)    (c) \((-\frac{2}{5})^3 \times \left(-\frac{1}{4}\right)^3\)
   (d) \(\frac{2 \times 3^4 \times 2^5}{9 \times 4^2}\)    (e) \((5^{-1} - 3^{-1})^{-1}\)    (f) \([\left(\frac{1}{2}\right)^2 \times \left(\frac{1}{3}\right)^4]^3 \times 3^{-2} \times \frac{1}{6}\)
   (g) \([7^{-1} + \left(\frac{3}{2}\right)^{-3}]^{-1}\)    (h) \(\frac{(2^5)^3 \times 7^3}{8^3 \times 7}\)    (i) \(\frac{3^7 \times a^5}{9^2 \times a^3}\)

7) Simplify and express the answer in exponential form:
   (a) \(\frac{3^7}{3^2} \times 3^4\)    (b) \([2(3)^2 \times 5^6] \times 3^6\)    (c) \(8^2 \div 2^3\)
   (d) \(\frac{2^3}{3} \times \frac{3^4}{9} \times \frac{4}{32}\)    (e) \(\frac{2^8 \times a^5}{4^3 \times a^3}\)    (f) \((3^0 + 2^0) \times 5^0\)
   (g) \((6^0 \div 7^0) + (8^0 - 7^0)\)    (h) \(\frac{75 \times 77}{5^3 \times 21}\)    (i) \(\frac{(5^5)^8}{(5^8)^5}\)
   (j) \(\frac{(7561)^{39}}{(7561)^{38}}\)
**Perimeter & Area**

1) Find the radius of the circle whose circumference is 616cm.

2) Find the area of a rectangular park having length 13m and breadth 8m in hectares.

3) In △ABC, AC=12cm, BC=10cm and AD=8cm. Find the area of △ABC and the length BE.

4) The area of a parallelogram is 2.75sq cm and one of its sides is 2.5cm. Find the length of its corresponding altitude.

5) The area of a parallelogram is 392 sq cm. If its altitude is twice the corresponding base, determine the length of the base and the altitude.

6) The ratio of the radii of two circles is 3:4, find the ratio of their circumference.

7) A steel wire when bent in the form of a square encloses an area of 484 sq cm. The same wire is rebent in the form of a circle. Find the area of the circle so formed.

8) A garden, 80m long and 65m wide, is surrounded by a 5m path outside it. Find the area of the path.

9) A path 7m wide runs along inside a square park of side 90m. Find the cost of constructing path at the rate of Rs 150 per sq m.

**Algebraic Expressions**

1) Simplify the following expression:
   \[ p^2q - [q^2p - rq - (qr - (p^2q + q^2r) + (q^3-p^3))] + p^3 - q^3 - r^3 \]
   and find the value when \( p = 1, \ q = -1 \) and \( r = 2 \)

2) What must be added to \( 4xy + 6x^2y - 9xy^2 \) to get \( 6xy - 4x^3 \)?

3) What must be subtracted from \( 4p^3q - 12p^2q + 6qp - 4q^3 \) to get \( 9p^3q + p^2q - 8q^3 \)?