

Rational and Irrational Numbers

1) State whether each of the following is rational or irrational:

(a) $\sqrt{5}$ (b) $\pi-1$ (c) 0.27 (d) 0.272727... (e) $\sqrt{81}$ (f) $\sqrt{2} \times \sqrt{3}$

(g) $\frac{\sqrt{8}}{\sqrt{2}}$ (h) $\frac{4}{\sqrt{2}}$ (i) $(5\sqrt{6})^2$ (j) $\sqrt{20} + \sqrt{5}$ (k) $\sqrt{2} \times \sqrt{18}$ (l) $2 + \sqrt{5}$ (m) $\frac{1}{\sqrt{2}-1}$

2) Write down an irrational number between 4 and 5.

3) Find a value of x (other than 0 or 3) such that $\sqrt{3} \times \sqrt{x}$ is rational.

4) Without using a calculator, write down the exact value of all the rational numbers in Q4.

5) Is $(\sqrt{5})^2$ rational? Is $(\sqrt{5})^3$ rational? Is $(\sqrt{5})^4$ rational? For what values of n is $(\sqrt{5})^n$ rational?