Contents

Proof of value of euler's number greater than 2

- $$e = 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + ... + \frac{1}{r!} + ...$$
- $$e = 2 + \frac{1}{2!} + \frac{1}{3!} + ... + \frac{1}{r!} + ...$$
- $$e > 2$$

Proof of value of euler's number less than three

- $$e = 2 + \frac{1}{2!} + \frac{1}{3!} + ... + \frac{1}{r!} + ...$$
- $$r! = 1.2.3.....r$$
- $$r! > 1.2.2.....r$$
- $$r! = 2^{r-1}$$
- $$\frac{1}{r!} < \frac{1}{2^{r-1}}$$
- $$e = 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \frac{1}{4!} + ...$$
- $$e = 1 + (\frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!}.... + \frac{1}{r!} + ...)$$
- $$e < 1 + (1 + \frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + ...)$$
- $$e = 1 + \frac{1}{1 - \frac{1}{2}} = 1 + 2 = 3$$
- $$e < 3$$