

Using a calculator

Why it is important to understand: Using a calculator.

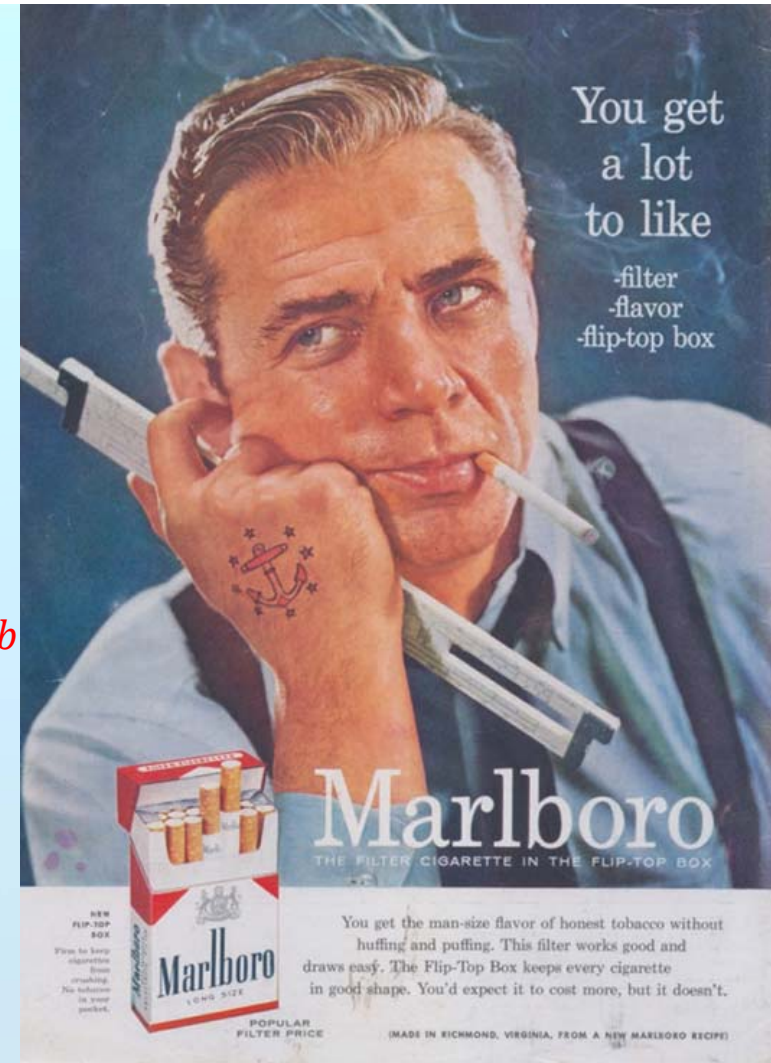
The availability of electronic pocket calculators, at prices which all can afford, has had a considerable impact on engineering education. Engineers and student engineers now use calculators all the time since calculators are able to handle a very wide range of calculations. You will feel more confident to deal with all aspects of engineering studies if you are able to correctly use a calculator accurately.



Advertisement that introduces an IBM electronic computer as equivalent to 150 slide rules (1951)

Before Calculators Was Slide Rules

$$\log(ab) = \log a + \log b$$



Marlboro advertisement that relates skill and independence to the slide rule (1956)

Problem 1. Evaluate $364.7 \div 57.5$ correct to 3 decimal places.

(i) Type in 364.7

(ii) Press \div .

(iii) Type in 57.5

(iv) Press = and the fraction $\frac{364.7}{57.5}$

(v) Press the $S \Leftrightarrow D$ function and the decimal answer 6.34260869... appears.

Alternatively, after step (iii) press Shift and = and the decimal will appear.

Hence, $364.7 \div 57.5 = 6.343$, correct to 3 decimal places.

Problem 2. Evaluate $\frac{12.7 \times 31.59}{70.45 \times 0.052}$

- (i) Type in 12.47
- (ii) Press \times .
- (iii) Type in 31.59
- (iv) Press \div .
- (v) The denominator must have brackets; i.e. press (.
- (vi) Type in 70.45×0.052 and complete the bracket; i.e. press)
- (vii) Press = and the answer 107.530518... appears.

Hence, $\frac{12.7 \times 31.59}{70.45 \times 0.052} = \mathbf{107.5}$ correct to 4 significant figures.

Now try the following Practice Exercise

Practice Exercise 12 Addition, subtraction, multiplication and division using a calculator

1. Evaluate $378.37 - 298.651 + 45.64 - 94.562$
2. Evaluate 25.63×465.34 correct to 5 significant figures.
3. Evaluate $562.6 \div 41.3$ correct to 2 decimal places.
4. Evaluate $\frac{17.35 \times 34.27}{41.53 \times 3.76}$ correct to 3 decimal places.
5. Evaluate $27.48 + 13.72 \times 4.15$ correct to 4 significant figures.
6. Evaluate $\frac{4.527 + 3.63}{452.51 \div 34.75} + 0.468$ correct to 5 significant figures.
7. Evaluate $52.34 - \frac{912.5 \div 41.46}{24.6 - 13.652}$ correct to 3 decimal places.
8. Evaluate $\frac{52.14 \times 0.347 \times 11.23}{19.73 \div 3.54}$ correct to 4 significant figures.
9. Evaluate $\frac{451.2}{24.54} - \frac{363.8}{46.79}$ correct to 4 significant figures.
10. Evaluate $\frac{45.6 - 7.35 \times 3.61}{4.672 - 3.12}$ correct to 3 decimal places.

1. 30.797
2. 11927
3. 13.62
4. 53.832
5. 84.42
6. 1.0944
7. 50.330
8. 36.45
9. 10.59
10. 12.325