MATC9 Ch01.4 Key Concepts 1 Evaluating Formulas Worked Example

Example: The range of an aircraft which is x km from an airport horizontally and y km above the ground is given by the formula $r = \sqrt{x^2 + y^2}$. Find the range of an aircraft which is 34 km away horizontally at an altitude of 9.6 km.

Solution: The value of x = 34 and the value of y = 9.6. Substitute these into the formula, and evaluate.

$$\begin{aligned} r &= \sqrt{34^2 + 9.6^2} \\ &= \sqrt{1248.16} \\ &= 35.3\,\text{km} \end{aligned}$$

The range is 35.3 km.

Practice:

1. The formula for the energy of a moving car is $E = 0.5mv^2$. Find the energy, in joules, of a 1200-kg car moving at 20 m/s.

2. Find the area of a circular swimming pool with a radius of 5.2 m.

Answers: 1. 240 000 joules 2. 84.9 m^2