# Added Value Unit

## Part One

**Time allowed:** 20 minutes

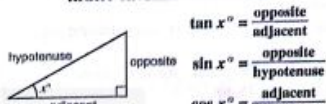You may **not** use a calculator for this part of the test.

**1.** 25% of the price of a CD is paid to a company for the design and manufacture of its packaging. How much is the company paid for a CD priced at £10?

**2.** The lateness of 8 trains was recorded. The results, in minutes, are shown.

5, 7, 8, 10, 10, 11, 12, 14

Find the mean lateness for these trains. Give your answer, in minutes, correct to 2 decimal places.

**3.** Sheila has 42 postage stamps. $\frac{5}{6}$ of the stamps are First Class. How many First Class stamps does Sheila have?

**4.** A barrel contains 13.7 litres of water. Petra adds 21.8 litres of water to the barrel. She then fills her watering can with 9.85 litres of water from the barrel. How much water is left in the barrel?

**5.** An electrician cut 5 lengths of cable, each 17.6 metres long. What is the total length of the five cables?
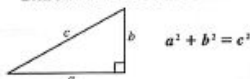
### FORMULAE LIST:

Circumference of a circle: $C = \pi d$

Area of a circle: $A = \pi r^2$
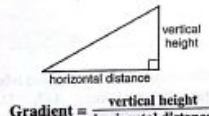
Volume of a triangular prism: $V = Ah$

### TRIGONOMETRY RATIOS IN A RIGHT-ANGLED TRIANGLE:

$\tan x° = \dfrac{\text{opposite}}{\text{adjacent}}$

$\sin x° = \dfrac{\text{opposite}}{\text{hypotenuse}}$

$\cos x° = \dfrac{\text{adjacent}}{\text{hypotenuse}}$

### THEOREM OF PYTHAGORAS:

$a^2 + b^2 = c^2$

### GRADIENT:

$\text{Gradient} = \dfrac{\text{vertical height}}{\text{horizontal distance}}$

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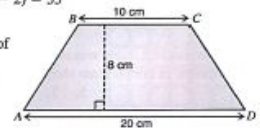## Part Two

**Time allowed:** 40 minutes

You may use a calculator for this part of the test.

**6.** Solve. (a) $7x - 2 = 3x + 30$  (b) $5(x - 2) = 35$

**7.** A scraper, used in cabinet work, is in the shape of a trapezium. $AD = 20\,cm$, $BC = 10\,cm$ and $AB = CD$. Find the area of the trapezium.

**8.** A pattern is made using black and white tiles.

Pattern 1   Pattern 2   Pattern 3

(a) Copy and complete the table for Pattern 3 and Pattern 4.

| Pattern number (n) | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Number of black tiles (b) | 8 | 12 | | |

(b) Write down a formula for calculating the number of black tiles (b) when you know the pattern number (n).

(c) Use your formula to find the number of black tiles in Pattern 20.

**9.** Craig drives 27 miles to work. His journey takes 45 minutes. What is Craig's average speed in miles per hour?

**10.** A wire used to keep a vertical aerial steady is 8.5 m long. It is attached to the aerial, 3 metres from the top of the aerial. The wire is fixed to level ground, 4.8 m from the base of the aerial. Find the height of the aerial. Give your answer in metres, correct to one decimal place.
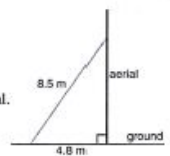
**11.** The diagram shows a river. A boat travels 38 m in crossing the river from P to Q. Its course makes an angle of 35° with the river bank. Find the width of the river, QR. Give your answer in metres, correct to one decimal place.
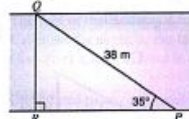
**12.** On squared paper, draw and label the x axis from −4 to 10 and the y axis from −6 to 7.

(a) Plot the points: $A(2, -5)$, $B(-2, -1)$ and $C(5, 6)$.

(b) Plot point D so that ABCD is a rectangle.