# 3.10 Conversions and Units: Test Pack

EDEXCEL 1MA1 · Calculator allowed · about 65 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

**Answer ALL questions. Show all your working.**

**1** Work out 4300 mm expressed in metres.

**(Total for Question 1 is 1 mark)**

**2** Write 0.45 litres as a number of cubic centimetres ($cm^3$).

**(Total for Question 2 is 2 marks)**

**3** A rug has area 1.5 $m^2$. Write this area in $cm^2$.

**(Total for Question 3 is 2 marks)**


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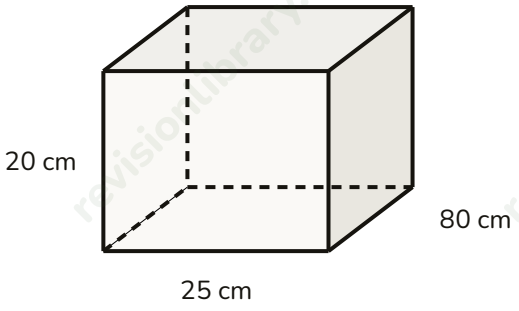
**4** Given that 1 stone is about 6.5 kg, change 10 stones into kg.

**(Total for Question 4 is 2 marks)**

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**5** A water tank is a cuboid 25 cm long, 80 cm wide and 20 cm high.
1 litre = 1000 $cm^3$. How many litres of water does it hold when full?

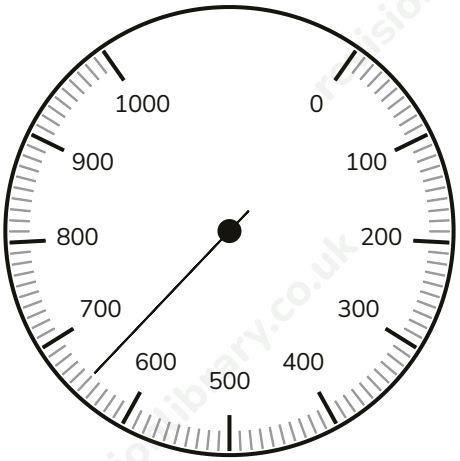
Diagram NOT accurately drawn




**(Total for Question 5 is 3 marks)**


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**6** Priya is weighing out sugar for a cake.




**(a)** Write down the mass of sugar shown on the scale, in grams. **(1)**

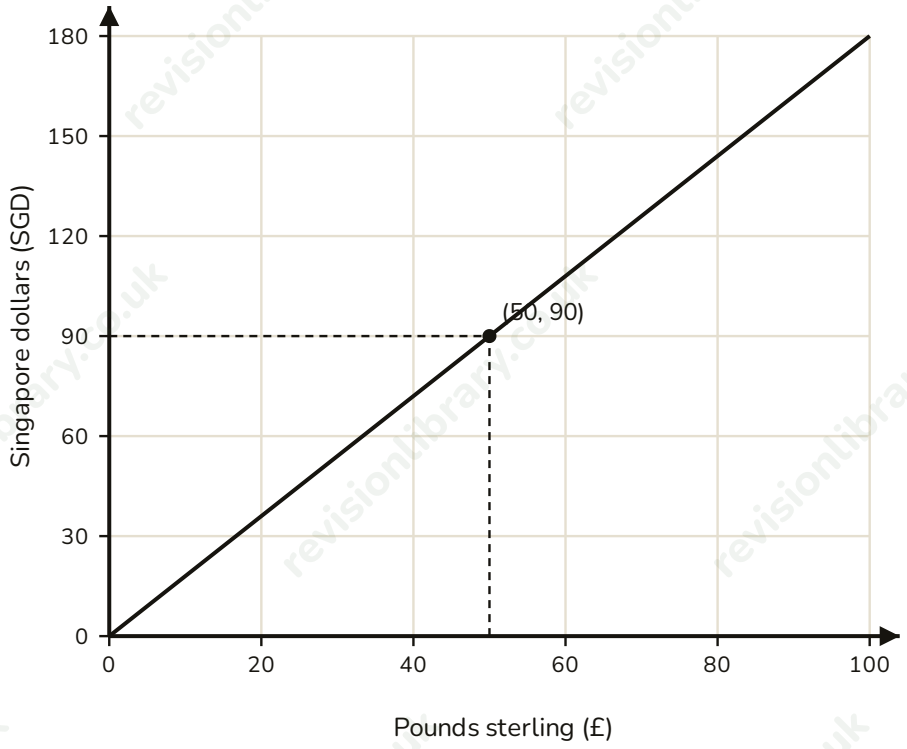
.....

**(b)** A recipe needs 0.8 kg of sugar. Does Priya have enough sugar to make the recipe? You must show working to support your answer. **(2)**

**(Total for Question 6 is 3 marks)**


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**7** The graph converts between £ (£) and Singapore dollars (SGD).




**(a)** Use the graph to change £40 into Singapore dollars. **(1)**

**(b)** Use the graph to change 108 Singapore dollars into £. **(2)**

**(Total for Question 7 is 3 marks)**

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**8** A car travels at a constant speed of 72 km/h.

**(a)** Show that this speed is equal to 20 m/s. **(2)**

**(b)** A cyclist travels at 8 m/s. Work out this speed in km/h. **(2)**

**(Total for Question 8 is 4 marks)**


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**9** Convert 0.003 km² into square metres ($m^2$).

**(Total for Question 9 is 2 marks)**

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**10** Convert 3.2 kilometres into metres.

**(Total for Question 10 is 1 mark)**

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**11** A rectangular metal plate measures 120 mm by 85 mm by 5 mm (thickness). Convert each dimension into centimetres and then work out the volume of the plate in cubic centimetres.

**(Total for Question 11 is 3 marks)**

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**12** A small bottle contains 250 cm³ of liquid with density 1.32 g/$cm^3$. Calculate the mass of the liquid in grams and give the mass in kilograms to 3 significant figures.

**(Total for Question 12 is 4 marks)**

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**13** A cylindrical water tank has radius 0.75 m and height 1.2 m. Work out the volume of the tank in litres. Give your answer to 1 decimal place. (Use π in your working.)

**(Total for Question 13 is 4 marks)**


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**14** A lorry carries fuel at a rate of 24 litres per minute to fill a generator. The generator requires fuel at a rate of 0.6 litres per second. Determine whether the lorry's supply rate is sufficient. Show your working and give a conclusion with appropriate units.

**(Total for Question 14 is 8 marks)**

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**15** Show that converting a speed of x metres per second into kilometres per hour gives 3.6x km/h. Then a car travels at 25 m/s. Without using a calculator, use your result to find its speed in km/h and determine whether it exceeds 90 km/h.

**(a)** Show that converting x m/s into km/h gives 3.6x km/h. **(3)**

**(b)** Use the result to find the speed of the car in km/h and state whether it exceeds 90 km/h. **(4)**

**(Total for Question 15 is 7 marks)**


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# Mark scheme · 3.10 Conversions and Units: Test Pack

## Question 1

4.3 m cao **B1**

**Answer: 4.3 m**

## Question 2

use 1 L = 1000 $cm^3$ and multiply 0.45 x 1000 oe **M1**

450 $cm^3$ cao **A1**

**Answer: 450 $cm^3$**

## Question 3

uses 1 $m^2$ = 100 x 100 = 10000 $cm^2$ **M1**

15000 $cm^2$ **A1**

**Answer: 15000 $cm^2$**

## Question 4

10 x 6.5 **M1**

65 kg **A1**

**Answer: 65 kg**

## Question 5

25 x 80 x 20 = 40000 **M1**

divides by 1000 **M1**

40 litres **A1**

**Answer: 40 litres**

## Question 6

(a) 650 cao **B1**

**(a) Answer: 650 g**

(b) converts 0.8 kg to 800 g, or 650 g to 0.65 kg, for comparison **M1**

(b) No, ft, with correct comparison stated (650 g is less than 800 g needed) **A1**

**(b) Answer: No, she does not have enough (she has 650 g but needs 800 g).**

## Question 7

(a) 72 (SGD), ft from graph, awrt 70-74 **B1**

**(a) Answer: 72 SGD**

(b) 108 / 1.8, or correct reading from the graph **M1**

(b) 60 (£) ft, awrt 58-62 **A1**

**(b) Answer: 60 GBP**

## Question 8

(a) 72 x 1000 / 3600, or equivalent unit conversion method **M1**

(a) 20 (m/s) cso, answer given **A1**

**(a) Answer: 20 m/s**

(b) 8 x 3600 / 1000, or equivalent unit conversion method **M1**

(b) 28.8 (km/h) cao **A1**

**(b) Answer: 28.8 km/h**

## Question 9

use 1 $km^2$ = 1 000 000 $m^2$, multiply 0.003 by 1 000 000 oe **M1**

3000 $m^2$ cao **A1**

**Answer: 3000 $m^2$**

## Question 10

3200 m cao **B1**

**Answer: 3200 m**

## Question 11

correct conversion to cm: 12.0 cm, 8.5 cm, 0.5 cm **M1**

method for volume: 12.0 * 8.5 * 0.5 **M1**

51 $cm^3$ cao **A1**

**Answer: 51 $cm^3$**

## Question 12

use mass = density * volume: 1.32 * 250 **M1**

330 g cao **A1**

convert to kg: 330 / 1000 **M1**

0.330 kg awrt to 3 s.f. cao **A1**

**Answer: 330 g and 0.330 kg**

## Question 13

use formula V = $\pi r^2 h$ and substitute r = 0.75, h = 1.2 oe **M1**

calculate $r^2 \times h = 0.75^2 \times 1.2 = 0.675$ oe **M1**

multiply by $\pi$ to get $m^3$ then convert to litres by x1000 oe **M1**

2120.6 L awrt (0.675 x $\pi$ x 1000 = 2120.6 L to 1 d.p.) **A1**

**Answer: 2120.6 L**

## Question 14

convert lorry rate to litres per second: 24 / 60 = 0.4 L/s **M1**

0.4 L/s cao **A1**

compare 0.4 L/s with generator need 0.6 L/s **M1**

state deficit: 0.6 - 0.4 = 0.2 L/s **M1**

0.2 L/s shortfall cao **A1**

convert shortfall to litres per minute if required: 0.2 * 60 = 12 L/min **M1**

12 L/min cao **A1**

conclusion: lorry rate is insufficient by 0.2 L/s or 12 L/min, so it cannot meet the generator demand **C1**

**Answer: Lorry supplies 24 L/min = 0.4 L/s. Generator needs 0.6 L/s. Shortfall 0.2 L/s = 12 L/min. Conclusion: supply is insufficient.**

## Question 15

(a) state or use 1 km = 1000 m and 1 h = 3600 s **M1**

(a) correct method: convert x m/s to km/h as (x / 1000) * 3600 km/h **M1**

(a) simplify 3600/1000 = 3.6 and conclude 3.6x km/h cao **A1**

**(a) Answer: 3.6x km/h**

(b) substitute x = 25 into 3.6x: 3.6 * 25 **M1**

(b) 90 km/h cao **A1**

(b) compare 90 km/h with 90 km/h **M1**

(b) correct conclusion: it does not exceed 90 km/h, it equals 90 km/h cao **A1**

**(b) Answer: 90 km/h; it does not exceed 90 km/h, it equals 90 km/h**


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