EGC
Eastern Goldfields College

Mathematics Essentials 2015
Test 2 Unit 2
Task Weighting: 13%

Student Name: _MARKING KEY_

Total Marks: 43

Time Allowed: 50 Minutes

Calculators and files are allowed in this test.
Answer all of the following questions. Show all working to maximise marks.

Question 1 [3 Marks: 1, 2]

In a car park, 10 cars are white, 5 are blue, 3 are black and 2 are red.

a) What is the ratio of black cars to white cars?

$3:10$ ✓

b) What is the ratio of blue to total? Simplify your answer.

$5:20$ ~ $1:4$ ✓ ✓

Question 2 [4 Marks: 1, 2, 1]

Simplify the following ratios.

a) 15 : 10

$3:2$ ✓

b) 360 : 80

$9:2$ ✓

c) 1.5 : 6

$3:12$
$= 1:4$ ✓ ✓

Question 3 [2 Marks]

In a mug of cappucino coffee, coffee syrup and hot milk are mixed in the ratio 2 : 3. A large mug holds 420 mL of cappucino coffee. How many mL of hot milk are in the mug of coffee?

$2+3 = 5$ ✓

$\frac{3}{5}$ of $420 = 252\,mL$ ✓

or

$2+3 = 5$
$420 \div 5 = 84$ ✓
$84 \times 3 =$
$= 420\,mL$ ✓

Question 4 [5 Marks: 2, 3]

(a) Share $15 between two friends in the ratio 1:2.

$5:10$ ✓ answer.

$1+2 = 3$ ✓ (recognising)
3 parts

(b) If three students share $50 cash between themselves equally, explain how much each student ends up with? Round your answer appropriately.

$50 \div 3 = 16.6$ ✓ ⟲
16.70

Each student receives $16.65 ✓

not quite → Must be spent as CASH ← (red)

Question 5 [3 Marks: 1, 1, 1]

Complete the following table:

Distance Travelled	Time Taken	Average Speed
120km	2 hours	60 km/h ✓
200km	4 hours	50km/h ✓
150km	5 hours	30km/h ✓

R/W.

Question 6 [5 Marks: 2, 3]

a) Convert 3.6 km / h to m / s

$3600\,m / 60\,min$
$3600m / 3600\,s$ ✓
$3600 \div 3600 = 1\,m/s$ ✓

b) If a go-cart travelled 2100 metres for 300 minutes, what was its speed in kilometres per hour?

$2100 = 2.1\,km$ ✓
$300\,min = 5\,hours.$ ✓

$2.1 \div 5 = 0.42\,km/hr.$ ✓ ✓

Question 7 [6 Marks: 2, 2, 2]

A petrol station has the following prices:

ULP (Unleaded)	125.6 cents per litre
PULP (Premium Unleaded)	141.5 cent per litre
Diesel	135.8 cents per litre

Find the cost of:

(a) 57.2L of Diesel, round your answer to nearest 10 cents.

$57.2 \times 135.8 = 7767.76 = \$77.6776$ $\$77.6776$

$= \$77.70$ $\approx \$77.70$

(b) 82L of ULP, round your answer to the nearest dollar.

$82 \times 125.6 = 10299.2 = \$102.992$

$\approx \$103$

(c) If you only had $40 how many litres of ULP could you buy? Round your answer to 1 decimal place.

$ULP = \$1.256/L$

$40 \div 1.256 = 31.8471 \approx 31.8 L$

$= 31.8 L$

Question 8 [3 marks: 1, 1, 1]

Don uses a drip system to water the small plants in his hothouse. Each plant needs 50 mL of water per day.

(a) How many litres of water are needed per day for 25 plants?

$50mL \times 25 = 1250L = 1.25L$ or $\frac{1}{2} + \frac{1}{2}$ $1.25L$.

(b) If 1 mL of water contains 12 drops, how many drops are needed to water each plant per day?

$50 \times 12 = 600 drops$

(c) What is the drip rate (in drops per minute) needed for each plant if the drip system runs for 4 hours per day?

$4hrs = 240min$

$\frac{600}{240} = 2.5 \ drops/min$

Question 9 [4 marks: 2, 2]

Select the best buy in each case below. (Show working to justify your choice)

(a) (250 g pack for $1.75)   or   500 g pack for $3.55

$\times 2$

$\$3.50$

(b) 200 g pack for $3.40   or   (250 g pack for $4.00)

$\div 4$ $503 = \$0.85$ $\div 500g = \$0.80$

$\div 200$ or $\div 250$

$\frac{1.7}{5} = \$0.017$ $\frac{4}{5} = 0.016$ → works

Question 10 [2 marks]

In Australia, 10% GST is added to the price of most items to determine the selling price. How much will Paul charge for a Nike Shirt priced at $86 before GST?

$\$86 \times 0.1 = \$8.60$

$+ \$86$

$\$94.60$

Question 11 [6 marks: 1, 2, 1, 2]

Thomas wanted to purchase a car valued at $13 290. He already had $2 500 in savings and wanted to borrow the rest from his rich Uncle Dave. Uncle Dave agreed to loan Thomas the money, on the condition he pay him back over 5 years at 8.5% simple interest per year.

a) How much did Thomas borrow?

$13290 - 2500 = \$10790$

b) How much interest will Thomas pay?

$S.I = 10790 \times 0.085 \times 5$

$= \$4585.75$ F.T.

c) What is the total amount that Thomas will pay his Uncle Dave?

$\$10790 + 4585.75 = \$15375.75$ F.T.

d) If Thomas makes monthly payments to his uncle, how much does each one need to be to repay the full loan within the time period given? Round your answer to the nearest cent.

$5 \times 12 = 60 \ months$

$15375.75 \div 60 = \$256.2608\overline{3} = \$256.26$ F.T.

END OF TEST