

Revision Sheet 5: Arithmetic

Q1. Arithmetic - The Basics (2nd Year Applied Arithmetic - Unit 3)

- a) Increase 600 by 5%.
- b) Train fares are increased by 4%.
 - i) Find the new fare if the old fare was €28
 - ii) If the new fare is €36.40, find the old fare.
- c) The price of a TV is €984. If this includes VAT at 23%, find the price before the VAT is added.
- d) In a sale, the price of a piece of furniture was reduced by 15%. If the sale price was €1360, what was the price before the sale?
- e)
 - i) By selling a laptop for €1150, a store makes a profit of 25%. At what price should the laptop be sold to make a profit of 20%?
 - ii) If the laptop is then sold for €1050, calculate the percentage profit margin.
- f) When Anna uses her car on a business trip, she is allowed to claim 68 cent per km for the first 80km and 42 cent per kilometre for the rest of the journey.
 - i) How much can she claim for a 135km journey?
 - ii) On one occasion she claimed €119.08. How far did she travel?
- g) The USC rates are 2% on the first €10036, 4% on the next €5980 and 7% on the balance. Aidan has an annual salary of €57000. Calculate his USC for the year.
- h) Angela has an annual salary of €46000. Her standard rate cut-off point is €28000 and her tax credit is €3200. The standard rate of income tax is 20% and the higher rate is 42%. She pays USC at the rates shown in the previous question and pays monthly trade union subscription fees of €15. Find
 - i) the gross income tax for the year
 - ii) the amount of income tax paid for the year
 - iii) the net income after all deductions
- i) A manager has an annual salary of €43000. Her tax credits amount to €3500 and she pays income tax on all of her income at a standard rate of $r\%$. If she pays €5960 in income tax for the year, find r .
- j) If €1 = 1.4 Canadian Dollars,
 - i) How many Canadian Dollars would you get for €3500?
 - ii) How many euro would you get for 5600 Canadian Dollars?
- k) An Australian tourist exchanged AUD2500 for euro at an Irish bank. The bank charged a percentage commission for the transaction. If the exchange rate was €1 = AUD1.36 and the tourist received €1801.47, find the percentage commission charged by the bank.
- l) Find the compound interest earned on €1200 for 3 years at 4%.
- m) €1500 was invested for 2 years at compound interest. The rate for the first year was 3% and the rate for the second year was 4%. Find the final amount at the end of the two years.

- n) €2500 was invested for one year and amounted to €2612.50 after the year. Calculate the rate of interest.
- o) What sum of money invested at 5% per annum compound interest would amount to €10988.78 in 6 years?
- p) A machine that cost €15000 depreciates by 15% per annum. Find its value at the end of four years.
- q) Ruth's electricity bill is based on the following details: Previous Meter Reading: 46523, Present Meter Reading: 48249, Charge per unit: 21.5cent, standing charge: €21.40, VAT @ 13.5%. Work out the total bill, including VAT.
- r) A prize fund is divided between A, B and C in the ratio 4:3:2 respectively. If C's share is €1224, find the total fund.
- s) €315 is shared among three people in the ratio 1:2: $\frac{1}{2}$. Calculate the smallest share.

Q2. Extra Challenge and Problem Solving

- a) A shop advertised "Everything half price in our sale", but also now advertises that there is "an additional 15% off sale prices". To what percentage reduction on the original price is the new offer equivalent?
- b) During a sale, all items of mens' clothing are reduced by 20% of the marked price.
- i) If the sale price of an overcoat was €336, what was the marked price?
- ii) If the store made a profit of 5% on the cost price of the overcoat during the sale, what percentage profit did it make on the marked price before the sale?
- c) A jar with 8 chocolates in it weighs 160g. The same jar with 20 chocolates in it weighs 304g. How much does the jar weigh on its own?
- d) Mark often travels to Dublin by train. An ordinary return ticket costs €34.50. A "leap card" costs €70. If he has one, the return ticket is only €23. If he buys one of these integrated travel cards, what is the least number of return trips to Dublin he must make for the total cost to be less than for ordinary tickets?
- e) A sum of money was invested for two years at compound interest. The rate for the first year was 6% and for the second year 5.5%. If the value of the investment at the end of the two years was €6709.80, find the sum invested.
- f) When the exchange rate is €1 = US\$1.28, a person changes \$1920 to euro. A charge is made for this service. What is the percentage charge if the person receives €1462.50?
- g) A woman invested €12000 in a building society at 7% per annum. At the end of the first year, she withdrew €B. If the value of her investment at the end of the second year was €8923.80, find the value of B.
- h) Cecil has a tax credit of €3600 a year and his standard rate cut-off point is €30000. The standard rate of income tax is 20% and the higher rate is 35%. If Cecil pays €7650 income tax for the year, find his gross salary.
- i) Explain briefly what is meant by the "standard rate cut-off point" in income tax calculations?

- j) The tallest building in the world in Dubai, the Burj Khalifa, has approximately 24000 windows and it takes 36 workers roughly 4 months to clean all the windows.
- Approximately, how many windows is each worker responsible for?
 - If 12 workers are laid off, how will that affect the time taken to clean the windows?
 - If they want to reduce the cleaning time to 3 months, how many workers will they need to hire?
- k) 12 blocklayers can build a wall in 15 days.
- How long would it take 20 blocklayers working at the same rate to do so?
 - How many blocklayers would be needed to build the wall in 10 days?
- l) A bath can be filled with the cold tap only in 8 minutes while it takes 12 minutes to fill it with the hot tap only. The bath's capacity is 960 litres.
- How many litres per minute flows through each tap?
 - How long does it take to fill the bath if both taps are turned on?
- m) To sell a house an estate agent charges a fee of 1.5% of the sale price. He also charges VAT of 20% on his fee. Calculate his total bill for a house that sells for €230000.
- n) What does VAT stand for?
- o) The number of pages in a magazine was increased from 64 to 80. If the price, which was previously €3.20, is increased in the same ratio, what should the new price be?
- p) An athlete can run 3000metres in 9 minutes. Express her average speed in kilometres per hour.
- q) A car travels 78km on 9 litres of petrol.
- How far is it likely to travel on 21 litres of petrol?
 - How many litres would be required for a journey of 390km?
- r) A car depreciates in value each year by 20% of its value at the beginning of that year. If the value of the car at the end of three years is €14336, find the value of the car when new.
- s) In compound interest calculations, what is meant by the "principal"?
- t) The area of a rectangle is 500m^2 . If length: breadth = 5:1, find the length and breadth of the rectangle.
- u) A tank was $\frac{3}{4}$ full of oil. 100 litres of oil were then used. If it was then $\frac{2}{3}$ full, how many litres does the tank hold when full?
- v) A bus company increases the price of all of its tickets by 6%. Before the increase, the price of a ticket from Cork to Dublin was €17.00.
- Find the price of this ticket after the increase.

Six months later, the company reduces the price of this ticket back to €17.00.

- ii) Find the percentage decrease in the price of this ticket. Give your answer correct to one decimal place.
- w) Write 10 cents as a fraction of €20.
- x) Mary's house was worth €180000. She increased the value of her house by 10% by building a conservatory. She then increased its value by a further 8% by repaving the driveway. Find the total percentage increase in value.
- y) Explain briefly what is meant by "depreciation".

Revision Sheet 5 Solutions:

Q1.

- a) €630 b) i) €29.12 ii) €35 c) €800 d) €1600 e) i) €1104 ii) 12.4%
f) i) €77.50 ii) 234 km g) €3308.80 h) i) €13160 ii) €9960 iii) €33321.20
i) 22% j) i) 4900 CAD ii) €4000 k) 2% l) €149.84
m) €1606.80 n) 4.5% o) €8200 p) €7830.10 q) €445.48 r) €5508
s) €45

Q2.

- a) 42.5% b) i) €420 ii) 31.25% c) 64g d) 7 trips e) €6000
f) 2.5% g) €4500 h) €45000
i) It is the amount of a person's income that they pay the standard/lower rate of tax on.
j) i) 666 ii) It will increase to 6 months. iii) They will need to hire 12 more.
k) i) 9 days ii) 18 blocklayers
l) i) Cold Tap = 120 Litres/min, Hot Tap = 80 Litres/min ii) 4.8mins
m) €4140 n) Value Added Tax o) €4 p) 20km/h q) i) 182km ii) 45 litres
r) €28000 s) It's the sum of money invested or borrowed. t) L = 50m, B = 10m
u) 1200 Litres v) i) €18.02 ii) 5.7% w) $\frac{1}{200}$ x) 18.8%
y) It means to lose value.