Number

(Past Year Topical Questions 2010-2015)

<u>May/June 2010 (41)</u>

1   A school has 220 boys and 280 girls.

(a) Find the ratio of boys to girls, in its simplest form.

Answer(a) .... : .... [1]

(b) The ratio of students to teachers is 10 : 1.
Find the number of teachers.

Answer(b) .... [2]

(c) There are 21 students on the school's committee.
The ratio of boys to girls is 3 : 4.
Find the number of girls on the committee.

Answer(c) .... [2]

(d) The committee organises a disco and sells tickets.
35% of the school's students each buy a ticket. Each ticket costs $1.60.
Calculate the total amount received from selling the tickets.

Answer(d) $ .... [3]

(e) The cost of running the disco is $264.
This is an increase of 10% on the cost of running last year's disco.
Calculate the cost of running last year's disco.

Answer(e) $ .... [2]

May/June 2010 (42)

1 Alberto and Maria share $240 in the ratio 3 : 5.

(a) Show that Alberto receives $90 and Maria receives $150.

Answer(a)

[1]

(b) (i) Alberto invests his $90 for 2 years at r % per year **simple** interest.
At the end of 2 years the amount of money he has is $99.
Calculate the value of r.

Answer(b)(i) $r =$ .... [2]

(ii) The $99 is 60% of the cost of a holiday.
Calculate the cost of the holiday.

Answer(b)(ii) $ .... [2]

(c) Maria invests her $150 for 2 years at 4% per year **compound** interest.
Calculate the exact amount Maria has at the end of 2 years.

Answer(c) $ .... [2]

(d) Maria continues to invest her money at 4% per year **compound** interest.
After 20 years she has $328.67.

(i) Calculate exactly how much more this is than $150 invested for 20 years at 4% per year **simple** interest.

Answer(d)(i) $ .... [3]

(ii) Calculate $328.67 as a percentage of $150.

Answer(d)(ii) .... % [2]

May/June 2010 (43)

1   Daniella is 8 years old and Edward is 12 years old.

    (a) Their parents give them some money in the ratio of their ages.

        (i) Write the ratio   Daniella's age : Edward's age   in its simplest form.

Answer(a)(i) .... : .... [1]

        (ii) Daniella receives $30.
             Show that Edward receives $45.

Answer(a)(ii)

[1]

        (iii) What percentage of the total amount of money given by their parents does Edward receive?

Answer(a)(iii) .... % [2]

    (b) Daniella invests her $30 at 3% per year, **compound** interest.
        Calculate the amount Daniella has after 2 years.
        Give your answer correct to 2 decimal places.

Answer(b) $ .... [3]

(c) Edward also invests $30.
He invests this money at a rate of $r\%$ per year, **simple** interest.
After 5 years he has a total amount of $32.25.
Calculate the value of r.

Answer(c) r = ... [2]

October/November 2010 (41)

1 **(a)** In 2008 the total number of tickets sold for an athletics meeting was 3136.
The ratio   child tickets sold : adult tickets sold = 17 : 32.

   (i) How many child tickets were sold?

Answer(a)(i) .... [2]

   (ii) Child tickets cost $2 each and adult tickets cost $4.50 each.

   Show that the total amount received from the sale of the tickets in 2008 was $11 392.

   Answer(a)(ii)

[2]

(b) In 2009 the amount received from the sale of tickets for the athletics meeting was $12 748.

Calculate the percentage increase in the amount received from 2008 to 2009.

Answer(b) .... % [3]

(c) In 2008 the amount of $11 392 was 28% more than the amount received in 2007.

Calculate how much was received in 2007.

Answer(c) $ .... [3]

October/November 2010 (42)

1 **(a)** Hansi and Megan go on holiday.
The costs of their holidays are in the ratio   Hansi : Megan = 7 : 4.
Hansi's holiday costs $756.
Find the cost of Megan's holiday.

Answer(a) $ .... [2]

(b) In 2008, Hansi earned $7800.

    (i) He earned 15% more in 2009.
       Calculate how much he earned in 2009.

Answer(b)(i) $ .... **[2]**

    (ii) In 2010, he earns 10% more than in 2009.
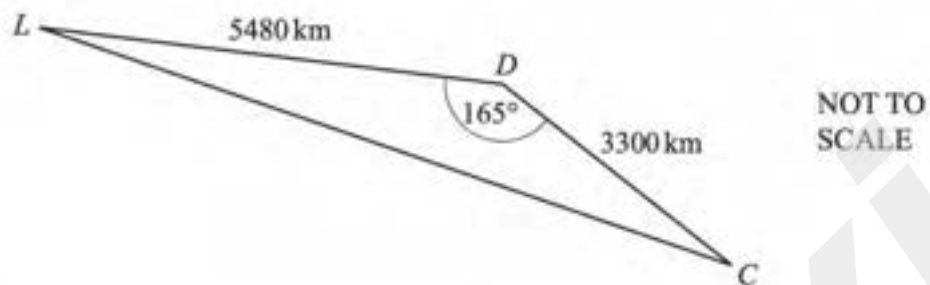   Calculate the percentage increase in his earnings from 2008 to 2010.

Answer(b)(ii) .... % **[3]**

(c) Megan earned $9720 in 2009. This was 20% more than she earned in 2008.
How much did she earn in 2008?

Answer(c) $ .... **[3]**

(d) Hansi invested $500 at a rate of 4% per year **compound** interest.
Calculate the final amount he had after three years.

Answer(d) $ .... **[3]**

6

The diagram shows the positions of London (*L*), Dubai (*D*) and Colombo (*C*).

(b) A plane flies from London to Dubai and then to Colombo.
It leaves London at 01 50 and the total journey takes 13 hours and 45 minutes.
The local time in Colombo is 7 hours ahead of London.
Find the arrival time in Colombo.

Answer(b) .... [2]

(c) Another plane flies the 8710 km directly from London to Colombo at an average speed of 800 km/h.
How much longer did the plane in **part (b)** take to travel from London to Colombo?
Give your answer in hours and minutes, correct to the nearest minute.

Answer(c) .... h .... min [4]

October/November 2010 (43)

1   Thomas, Ursula and Vanessa share $200 in the ratio

Thomas : Ursula : Vanessa = 3 : 2 : 5.

(a) Show that Thomas receives $60 and Ursula receives $40.

Answer(a)

[2]

(b) Thomas buys a book for $21.
What percentage of his $60 does Thomas have left?

Answer(b) .... % [2]

(c) Ursula buys a computer game for $36.80 in a sale.
The sale price is 20% less than the original price.
Calculate the original price of the computer game.

Answer(c) $ .... [3]

(d) Vanessa buys some books and some pencils.
Each book costs $12 more than each pencil.
The total cost of 5 books and 2 pencils is $64.20.
Find the cost of one pencil.

Answer(d) $ .... [3]

May/June 2011 (41)

1   A school has a sponsored swim in summer and a sponsored walk in winter.
    In 2010, the school raised a total of $1380.
    The ratio of the money raised in   summer : winter = 62 : 53.

    (a) **(i)**   Show clearly that $744 was raised by the swim in **summer**.

    Answer (a)(i)

                                                                                    [1]

    (ii)   Alesha's swim raised $54.10. Write this as a percentage of $744.

                                            Answer(a)(ii) .... %[1]

    (iii)   Bryan's swim raised $31.50.
            He received 75 cents for each length of the pool which he swam.

            Calculate the number of lengths Bryan swam.

                                            Answer(a)(iii) .... [2]

(c) The total amount, $1380, raised in 2010 was 8% **less** than the total amount raised in 2009.

Calculate the total amount raised in 2009.

Answer(c) $ .... [3]

May/June 2011 (42)

1 **(a)** Work out the following.

(i) $\dfrac{1}{0.2^2}$

Answer(a)(i) .... [1]

(ii) $\sqrt{5.1^2 + 4 \times 7.3^2}$

Answer(a)(ii) .... [1]

(iii) $25^{\frac{1}{2}} \times 1000^{-\frac{2}{3}}$

Answer(a)(iii) .... [2]

(b) Mia invests $7500 at 3.5% per year **simple** interest.
Calculate the total amount she has after 5 years.

Answer(b) $ .... [3]

(c) Written as the product of prime factors $48 = 2^4 \times 3$.

(i) Write 60 as the product of prime factors.

Answer(c)(i) .... [2]

(ii) Work out the highest common factor (HCF) of 48 and 60.

Answer(c)(ii) .... [2]

(iii) Work out the lowest common multiple (LCM) of 48 and 60.

Answer(c)(iii) .... [2]

Question 2c

(c) (i) A rod has length 2.9 m, correct to 1 decimal place.

What is the upper bound for the length of the rod?

Answer(c)(i) .... m [1]

Question 3b

(b) A plane leaves town *C* at 11 57 and flies 1500 km to another town, landing at 14 12.

Calculate the average speed of the plane.

Answer(b) .... km/h [3]

May/June 2011 (43)

1 Lucy works in a clothes shop.

(a) In one week she earned $277.20.

(i) She spent $\frac{1}{8}$ of this on food.

Calculate how much she spent on food.

Answer(a)(i) $ .... [1]

(ii) She paid 15% of the $277.20 in taxes.
Calculate how much she paid in taxes.

Answer(a)(ii) $ .... [2]

(iii) The $277.20 was 5% more than Lucy earned in the previous week.
Calculate how much Lucy earned in the previous week.

Answer(a)(iii) $ .... [3]

(b) The shop sells clothes for men, women and children.

(i) In one day Lucy sold clothes with a total value of $2200 in the ratio

men : women : children = 2 : 5 : 4.

Calculate the value of the women's clothes she sold.

Answer(b)(i) $ .... [2]

(ii) The $2200 was $\frac{44}{73}$ of the total value of the clothes sold in the shop on this day.

Calculate the total value of the clothes sold in the shop on this day.

Answer(b)(ii) $ .... [2]

October/November 2011 (41)

1 **(a)** Abdullah and Jasmine bought a car for $9000.
Abdullah paid 45% of the $9000 and Jasmine paid the rest.

(i) How much did Jasmine pay towards the cost of the car?

Answer(a)(i) $ .... [2]

(ii) Write down the ratio of the payments Abdullah : Jasmine in its simplest form.

Answer(a)(ii) .... : .... [1]

(b) Last year it cost $2256 to run the car.
Abdullah, Jasmine and their son Henri share this cost in the ratio $8:3:1$.
Calculate the amount each paid to run the car.

Answer(b) Abdullah $ ....

Jasmine $ ....

Henri $ .... **[3]**

(c) (i) A new truck costs $15\,000$ and loses 23% of its value **each year**.
Calculate the value of the truck after three years.

Answer(c)(i) $ .... **[3]**

(ii) Calculate the overall percentage loss of the truck's value after three years.

Answer(c)(ii) .... % **[3]**

9   (a) $72 = 2 \times 2 \times 2 \times 3 \times 3$ written as a product of prime factors.

   (i)   Write the number 126 as a product of prime factors.

Answer(a)(i) $126 =$ .... [2]

   (ii)   Find the value of the highest common factor of 72 and 126.

Answer(a)(ii) .... [1]

   (iii)   Find the value of the lowest common multiple of 72 and 126.

Answer(a)(iii) .... [2]

October/November 2011 (42)

1   Children go to camp on holiday.

   (a) Fatima buys bananas and apples for the camp.

      (i) Bananas cost $0.85 per kilogram.

        Fatima buys 20kg of bananas and receives a discount of 14%.

        How much does she spend on bananas?

Answer(a)(i) $ .... [3]

      (ii) Fatima spends $16.40 on apples after a discount of 18%.

        Calculate the original price of the apples.

Answer(a)(ii) $ .... [3]

(iii) The ratio   number of bananas : number of apples $= 4 : 5$.

There are 108 bananas.

Calculate the number of apples.

Answer(a)(iii) .... [2]

(c) The children travel 270 km to the camp, leaving at 07 43 and arriving at 15 13.

Calculate their average speed in km/h.

Answer(c) .... km/h [3]

(d) Two years ago $540 was put in a savings account to pay for the holiday.

The account paid **compound** interest at a rate of 6% per year.

How much is in the account now?

Answer(d) $ .... [2]

4   Boris has a recipe which makes 16 biscuits.

The ingredients are

160 g flour,

160 g sugar,

240 g butter,

200 g oatmeal.

(a)   Boris has only 350 grams of oatmeal but plenty of the other ingredients.

(i)   How many biscuits can he make?

Answer(a)(i)   ....   [2]

(ii)   How many grams of butter does he need to make this number of biscuits?

Answer(a)(ii)   ....   g [2]

October/November 2011 (43)

5 **(a)** The cost of a bottle of juice is 5 cents more than the cost of a bottle of water.
Mohini buys 3 bottles of water and 6 bottles of juice.
The total cost is $5.25.

Find the cost of a bottle of water.
Give your answer in cents.

Answer(a) .... cents [4]

May/June 2012 (41)

1 Anna, Bobby and Carl receive a sum of money.
They share it in the ratio $12:7:8$.
Anna receives $504.

(a) Calculate the **total** amount.

Answer(a) $ .... [3]

(b) (i) Anna uses 7% of her $504 to pay a bill.
Calculate how much she has left.

Answer(b)(i) $ .... [3]

(ii) She buys a coat in a sale for $64.68.
This was 23% less than the original price.
Calculate the original price of the coat.

Answer(b)(ii) $ .... [3]

(c) Bobby uses $250 of his share to open a bank account.
This account pays compound interest at a rate of 1.6% per year.
Calculate the amount in the bank account after 3 years.
Give your answer correct to 2 decimal places.

Answer(c) $ .... [3]

(d) Carl buys a computer for $288 and sells it for $324.
Calculate his percentage profit.

Answer(d) .... % [3]

May/June 2012 (42)

2   **(a)**   In a sale, Jen buys a laptop for $351.55.
This price is 21% less than the price before the sale.

Calculate the price before the sale.

Answer(a) $ .... [3]

(b) Alex invests $4000 at a rate of 8% per year simple interest for 2 years.
Bob invests $4000 at a rate of 7.5% per year compound interest for 2 years.

Who receives more interest and by how much?

Answer(b) .... receives $ .... more interest. [6]

5   (a) In Portugal, Miguel buys a book about planets.
The book costs €34.95.
In England the same book costs £27.50.
The exchange rate is £1 = €1.17.

Calculate the difference in pounds (£) between the cost of the book in Portugal and England.

Answer(a) £ .... [2]

(b) In the book, the distance between two planets is given as 4.07×10^{12} kilometres.
The speed of light is 1.1×10^9 kilometres per hour.

Calculate the time taken for light to travel from one of these planets to the other.
Give your answer in days and hours.

Answer(b) .... days .... hours [3]

(c) In one of the pictures in the book, a rectangle is drawn.
The rectangle has length 9.3 cm and width 5.6 cm, both correct to one decimal place.

(i) What is the lower bound for the length?

Answer(c)(i) .... cm [1]

(ii) Work out the lower and upper bounds for the area of the rectangle.

Answer(c)(ii) Lower bound = ... cm^2

Upper bound = ... cm^2 [2]

May/June 2012 (43)

1 A train travels from Paris to Milan.

(a) The train departs from Paris at 20 28 and the journey takes 9 hours 10 minutes.

(i) Find the time the train arrives in Milan.

Answer(a)(i) .... [1]

(ii) The distance between Paris and Milan is 850 km.

Calculate the average speed of the train.

Answer(a)(ii) .... km/h [2]

(b) The total number of passengers on the train is 640.

    (ii) There are men, women and children on the train in the ratio

        men : women : children = 4 : 3 : 1.

    Show that the number of women on the train is 240.

    Answer(b)(ii)

                              [2]

    (iii) 240 is an increase of 60% on the number of women on the train the previous day.

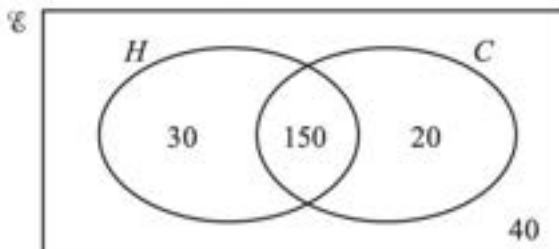   Calculate the number of women on the train the previous day.

                       Answer(b)(iii) .... [3]

(c) The length of the train is 210 m.
It passes through a station of length 340 m, at a speed of 180 km/h.

Calculate the number of seconds the train takes to pass completely through the station.

Answer(c) .... s [3]

6

$\mathcal{E}$ = {240 passengers who arrive on a flight in Cyprus}

H = {passengers who are on holiday}

C = {passengers who hire a car}

(a) Write down the number of passengers who

   (i) are on holiday,

   Answer(a)(i) .... [1]

   (ii) hire a car but are not on holiday.

   Answer(a)(ii) .... [1]

(b) Find the value of $n(H \cup C')$.

   Answer(b) .... [1]

<u>October/November 2012 (41)</u>

3 90 students are asked which school clubs they attend.
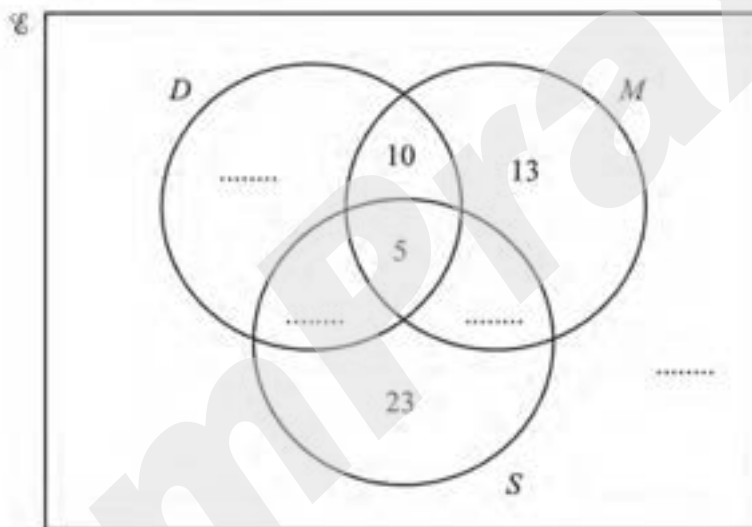
D = {students who attend drama club}
M = {students who attend music club}
S = { students who attend sports club}

39 students attend music club.
26 students attend **exactly two** clubs.
35 students attend drama club.

(a) Write the four missing values in the Venn diagram. [4]

(b) How many students attend

    (i) all three clubs,

Answer(b)(i) .... [1]

    (ii) one club only?

Answer(b)(ii) .... [1]

(c) Find

    (i) n(D ∩ M),

Answer(c)(i) .... [1]

    (ii) n((D ∩ M) ∩ S′).

Answer(c)(ii) .... [1]

9   Distances from the Sun can be measured in astronomical units, AU.
Earth is a distance of 1 AU from the Sun.
One AU is approximately 1.496×10^8 km.

The table shows distances from the Sun.

Name	Distance from the Sun in AU	Distance from the Sun in kilometres
Earth	1	1.496×10^8
Mercury	0.387	....
Jupiter	....	7.79×10^8
Pluto	....	5.91×10^9

(a) Complete the table. [3]

(b) Light travels at approximately 300 000 kilometres per second.

    (i) How long does it take light to travel from the Sun to Earth?
        Give your answer in seconds.

Answer(b)(i) .... s [2]

(ii) How long does it take light to travel from the Sun to Pluto?
Give your answer in minutes.

Answer(b)(ii) .... min [2]

(c) One light year is the distance that light travels in one year (365 days).

How far is one light year in kilometres?
Give your answer in standard form.

Answer(c) .... km [3]

(d) How many astronomical units (AU) are equal to one light year?

Answer(d) .... AU [2]

October/November 2012 (42)

1 A factory produces bird food made with sunflower seed, millet and maize.

(a) The amounts of sunflower seed, millet and maize are in the ratio

sunflower seed : millet : maize = 5 : 3 : 1 .

(i) How much millet is there in 15 kg of bird food?

Answer(a)(i) .... kg [2]

(ii) In a small bag of bird food there is 60 g of sunflower seed.

What is the mass of bird food in a small bag?

Answer(a)(ii) .... g [2]

(b) Sunflower seeds cost $204.50 for 30 kg from Jon's farm or €96.40 for 20 kg from Ann's farm. The exchange rate is $1 = €0.718.

Which farm has the cheapest price per kilogram?
You must show clearly all your working.

Answer(b) .... [4]

(c) Bags are filled with bird food at a rate of 420 grams per second.

How many 20 kg bags can be **completely** filled in 4 hours?

Answer(c) .... [3]

(d) Brian buys bags of bird food from the factory and sells them in his shop for $15.30 each.
He makes 12.5% profit on each bag.

How much does Brian pay for each bag of bird food?

Answer(d) $ .... [3]

October/November 2012 (43)

1 (a) The Martinez family travels by car to Seatown.
The distance is 92 km and the journey takes 1 hour 25 minutes.

    (i) The family leaves home at 07 50.
Write down the time they arrive at Seatown.

Answer(a)(i) .... [1]

    (ii) Calculate the average speed for the journey.

Answer(a)(ii) .... km/h [2]

(iii) During the journey, the family stops for 10 minutes.

Calculate 10 minutes as a percentage of 1 hour 25 minutes.

Answer(a)(iii) .... % [1]

(iv) 92 km is 15% more than the distance from Seatown to Deecity.

Calculate the distance from Seatown to Deecity.

Answer(a)(iv) .... km [3]

(b) The Martinez family spends $150 in the ratio

fuel : meals : gifts = 11 : 16 : 3 .

(i) Show that $15 is spent on gifts.

Answer (b)(i)

[2]

(ii) The family buys two gifts.
The first gift costs $8.25.

Find the ratio

cost of first gift : cost of second gift.

Give your answer in its simplest form.

Answer(b)(ii) .... : .... [2]

May/June 2013 (41)

1 (a) One day, Maria took 27 minutes to walk 1.8 km to school.
She left home at 07 48.

(i) Write down the time Maria arrived at school.

Answer(a)(i) .... [1]

(ii) Show that Maria's average walking speed was 4 km/h.

Answer(a)(ii)

[2]

(b) Another day, Maria cycled the 1.8 km to school at an average speed of 15 km/h.

(i) Calculate the percentage increase that 15 km/h is on Maria's walking speed of 4 km/h.

Answer(b)(i) .... % [3]

(ii) Calculate the percentage **decrease** that Maria's cycling time is on her walking time of 27 minutes.

Answer(b)(ii) .... % [3]

(iii) After school, Maria cycled to her friend's home.
This took 9 minutes, which was 36% of the time Maria takes to walk to her friend's home.

Calculate the time Maria takes to walk to her friend's home.

Answer(b)(iii) .... min [2]

May/June 2013 (42)

1   A tennis club has 560 members.

   (a)   The ratio   men : women : children = 5 : 6 : 3.

      (i)   Show that the club has 240 women members.

         Answer(a)(i)

                                                                                   [2]

      (ii)   How many members are children?

                                      Answer(a)(ii) .... [1]

   (b) $\frac{5}{8}$ of the 240 women members play in a tournament.

      How many women members do **not** play in the tournament?

                                      Answer(b) .... [2]

   (c)   The annual membership fee in 2013 is $198 for each adult and $75 for each child.

      (i)   Calculate the total amount the 560 members pay in 2013.

                                      Answer(c)(i) $ .... [2]

(ii) The adult fee of $198 in 2013 is 5.6% more than the fee in 2012.

Calculate the adult fee in 2012.

Answer(c)(ii) $ .... [3]

(d) The club buys 36 tennis balls for $9.50 and sells them to members for $0.75 each.

Calculate the percentage profit the club makes.

Answer(d) .... % [3]

(e) A tennis court is a rectangle with length 23.7 m and width 10.9 m, each correct to 1 decimal place.

Calculate the upper and lower bounds of the perimeter of the court.

Answer(e) Upper bound .... m

Lower bound .... m [3]

May/June 2013 (43)

1 (a) Ali and Ben receive a sum of money.
They share it in the ratio 5 : 1.
Ali receives $2345.

Calculate the total amount.

Answer(a) $ .... [2]

(b) Ali uses 11% of his $2345 to buy a television.

Calculate the cost of the television.

Answer(b) $ .... [2]

(c) A different television costs $330.

    (i) Ben buys one in a sale when this cost is reduced by 15%.

    How much does Ben pay?

Answer(c)(i) $ .... [2]

    (ii) $330 is 12% less than the cost last year.

    Calculate the cost last year.

Answer(c)(ii) $ .... [3]

(d) Ali invests $1500 of his share in a bank account.
The account pays compound interest at a rate of 2.3% per year.

Calculate the total amount in the account at the end of 3 years.

Answer(d) $ .... [3]

(e) Ali also buys a computer for $325.
He later sells this computer for $250.

Calculate Ali's percentage loss.

Answer(e) .... % [3]

<u>October/November 2013 (41)</u>

1   David sells fruit at the market.

   (a)   In one week, David sells 120 kg of tomatoes and 80 kg of grapes.

       (i)   Write 80 kg as a fraction of the total mass of tomatoes and grapes.
             Give your answer in its lowest terms.

                                              Answer(a)(i) .... [1]

       (ii)   Write down the ratio   mass of tomatoes : mass of grapes.
              Give your answer in its simplest form.

                                      Answer(a)(ii) .... : .... [1]

   (b)   (i)   One day he sells 28 kg of oranges at $1.56 per kilogram.
             He also sells 35 kg of apples.
             The total he receives from selling the oranges and the apples is $86.38 .

             Calculate the price of 1 kilogram of apples.

                                              Answer(b)(i) $ .... [2]

       (ii)   The price of 1 kilogram of oranges is $1.56 .
              This is 20% more than the price two weeks ago.

              Calculate the price two weeks ago.

                                              Answer(b)(ii) $ .... [3]

(c) On another day, David received a total of $667 from all the fruit he sold.
The cost of the fruit was $314.20 .
David worked for $10\frac{1}{2}$ hours on this day.

Calculate David's rate of profit in dollars per hour.

Answer(c) .... dollars/h [2]

October/November 2013 (42)

1 Last year Mukthar earned $18 900 .
He did not pay tax on $5500 of his earnings.
He paid 24% tax on his remaining earnings.

(a) (i) Calculate how much tax Mukthar paid last year.

Answer(a)(i) $ .... [2]

(ii) Calculate how much Mukthar earned each month after tax had been paid.

Answer(a)(ii) $ .... [2]

(b) This year Mukthar now earns $19 750.50 .

Calculate the percentage increase from $18 900.

Answer(b) .... % [2]

(c) Mukthar has $1500 to invest in one of the following ways.

- **Account A** paying **simple** interest at a rate of 4.1% per year

- **Account B** paying **compound** interest at a rate of 3.3% per year

Which account will be worth more after 3 **years** and by how much?

Answer(c) Account .... by $ .... [5]

7   Noma flies from Johannesburg to Hong Kong.
   Her plane leaves Johannesburg at 1845 and arrives in Hong Kong 13 hours and 25 minutes later.
   The local time in Hong Kong is 6 hours ahead of the time in Johannesburg.

   (a) At what time does Noma arrive in Hong Kong?

Answer(a) .... [2]

   (b) Noma sleeps for part of the journey.
       The time that she spends sleeping is given by the ratio

$$\text{sleeping} : \text{awake} = 3:4.$$

   Calculate how long Noma sleeps during the journey.
   Give your answer in hours and minutes.

Answer(b) .... h .... min [2]

(c) (i) The distance from Hong Kong to Johannesburg is 10 712 km.
The time taken for the journey is 13 hours and 25 minutes.

Calculate the average speed of the plane for this journey.

Answer(c)(i) .... km/h [2]

(ii) The plane uses fuel at the rate of 1 litre for every 59 metres travelled.

Calculate the number of litres of fuel used for the journey from Johannesburg to Hong Kong.
Give your answer in standard form.

Answer(c)(ii) .... litres [4]

(d) The cost of Noma's journey is 10 148 South African Rand (R).
This is an increase of 18% on the cost of the journey one year ago.

Calculate the cost of the same journey one year ago.

Answer(d) R .... [3]

October/November 2013 (43)

1 (a) (i) In a camera magazine, 63 pages are used for adverts.
The ratio   number of pages of adverts : number of pages of reviews = 7:5 .

Calculate the number of pages used for reviews.

Answer(a)(i) .... [2]

(ii) In another copy of the magazine, 56 pages are used for reviews and for photographs.
The ratio   number of pages of reviews : number of pages of photographs = 9:5 .

Calculate the number of pages used for photographs.

Answer(a)(ii) .... [2]

(iii) One copy of the magazine costs $4.90 .
An annual subscription costs $48.80 for 13 copies.

Calculate the percentage discount by having an annual subscription.

Answer(a)(iii) .... % [3]

(b) In a car magazine,   25% of the pages are used for selling second-hand cars,
$62\frac{1}{2}$% of the remaining pages are used for features,
and the other 36 pages are used for reviews.

Work out the total number of pages in the magazine.

Answer(b) .... [4]

<u>May/June 2014 (41)</u>

3 (a) The running costs for a papermill are $75 246.
This amount is divided in the ratio labour costs : materials = 5 : 1.

Calculate the labour costs.

Answer(a) $ .... [2]

(b) In 2012 the company made a profit of $135 890.
In 2013 the profit was $150 675.

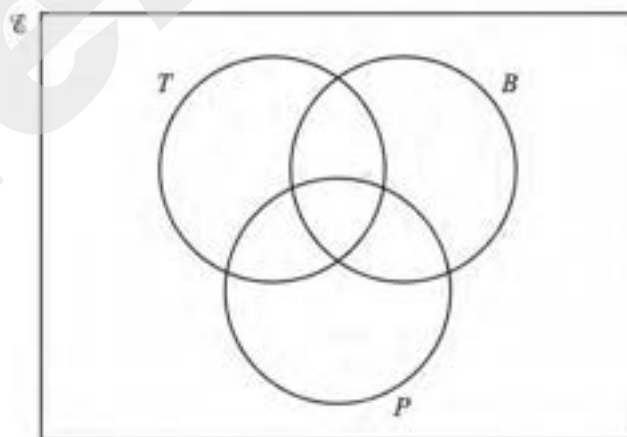Calculate the percentage increase in the profit from 2012 to 2013.

Answer(b) .... % [3]

(c) The profit of $135 890 in 2012 was an increase of 7% on the profit in 2011.

Calculate the profit in 2011.

Answer(c) $ .... [3]

Question 4d

(d)

Shade the region $B \cap (T \cup P)'$. [1]

May/June 2014 (42)

1   Jane and Kate share $240 in the ratio   5 : 7 .

   (a) Show that Kate receives $140.

     Answer(a)

                                                                                       [2]

   (b) Jane and Kate each spend $20.

     Find the new ratio   Jane's remaining money : Kate's remaining money.
     Give your answer in its simplest form.

                                           Answer(b) .... : .... [2]

(c) Kate invests $120 for 5 years at 4% per year simple interest.

Calculate the total amount Kate has after 5 years.

Answer(c) $ .... [3]

(d) Jane invests $80 for 3 years at 4% per year compound interest.

Calculate the total amount Jane has after 3 years.
Give your answer correct to the nearest cent.

Answer(d) $ .... [3]

(e) An investment of $200 for 2 years at 4% per year compound interest is the same as an investment of $200 for 2 years at r% per year simple interest.

Find the value of r.

Answer(e) r = ... [3]

May/June 2014 (43)

1   In July, a supermarket sold 45 981 bottles of fruit juice.

   (a) The cost of a bottle of fruit juice was $1.35 .

        Calculate the amount received from the sale of the 45 981 bottles.
        Give your answer correct to the nearest hundred dollars.

        Answer(a) $ .... [2]

   (b) The number of bottles sold in July was 17% more than the number sold in January.

        Calculate the number of bottles sold in January.

        Answer(b) .... [3]

   (c) There were 3 different flavours of fruit juice.
        The number of bottles sold in each flavour was in the ratio   apple : orange : cherry = 3 : 4 : 2.
        The total number of bottles sold was 45 981.

        Calculate the number of bottles of orange juice sold.

        Answer(c) .... [2]

   (d) One bottle contains 1.5 litres of fruit juice.

        Calculate the number of 330 ml glasses that can be filled completely from one bottle.

        Answer(d) .... [3]

(e) $\frac{5}{9}$ of the 45 981 bottles are recycled.

Calculate the number of bottles that are recycled.

Answer(e) .... [2]

October/November 2014 (41)

1   (a)   A company makes compost by mixing loam, sand and coir in the following ratio.

loam : sand : coir = 7 : 2 : 3

(i)   How much loam is there in a 72 litre bag of the compost?

Answer(a)(i) .... litres [2]

(ii)   In a small bag of the compost there are 13.5 litres of coir.

How much compost is in a small bag?

Answer(a)(ii) .... litres [2]

(iii)   The price of a large bag of compost is $8.40 .
This is an increase of 12% on the price last year.

Calculate the price last year.

Answer(a)(iii) $ .... [3]

Question 2d

(d) Asma runs 22 kilometres, correct to the nearest kilometre.
She takes $2\frac{1}{2}$ hours, correct to the nearest half hour.

Calculate the upper bound of Asma's speed.

Answer(d) .... km/h [3]

October/November 2014 (42)

1 (a) Alfonso has \$75 to spend on the internet.
He spends some of the money on music, films and books.

(i) The money he spends on music, films and books is in the ratio

music : films : books = 5 : 3 : 7.

He spends \$16.50 on music.

Calculate the **total** amount he spends on music, films and books.

Answer(a)(i) \$ .... [3]

(ii) Find this total amount as a percentage of the \$75.

Answer(a)(ii) .... % [1]

(b) The download times for the music, films and books are in the ratio

$$music : films : books = 2 : 9 : 1.$$

The **total** download time is 3 hours and 33 minutes.

Calculate the download time for the films.
Give your answer in hours, minutes and seconds.

Answer(b) .... hours .... minutes .... seconds [3]

(c) The cost of $16.50 for the music was a reduction of 12% on the original cost.

Calculate the original cost of the music.

Answer(c) $.. [3]

Question 8d

(d) The ship takes 2 hours and 15 minutes to sail the 74 km from *P* to *Q*.

Calculate the average speed in knots.
[1 knot = 1.85 km/h]

Answer(d) .... knots [3]

October/November 2014 (43)

2   There are three different areas, A, B and C, for seating in a theatre.
The numbers of seats in each area are in the ratio $A:B:C = 11:8:7$.
There are 920 seats in area B.

(a) (i) Show that there are 805 seats in area C.

Answer(a)(i)

[1]

(ii) Write the number of seats in area B as a percentage of the total number of seats.

Answer(a)(ii) .... % [2]

(b) The cost of a ticket for a seat in each area of the theatre is shown in the table.

Area A	$11.50
Area B	$15
Area C	$22.50

For a concert 80% of area B tickets were sold and $\frac{3}{5}$ of area C tickets were sold.
The total amount of money taken from ticket sales was $35 834.

Calculate the number of area A tickets that were sold.

Answer(b) .... [5]

(c) The total ticket sales of $35 834 was 5% less than the ticket sales at the previous concert.

Calculate the ticket sales at the previous concert.

Answer(c) $.. [3]

Question 9b and 9c

(b) Manuel completed a journey of 320 km in his car.
The fuel for the journey cost $1.28 for every 6.4 km travelled.

(i) Calculate the cost of fuel for this journey.

Answer(b)(i) $.................................... [2]

(ii) When Manuel travelled 480 km in his car it used 60 litres of fuel.
Manuel's car used fuel at the same rate for the journey of 320 km.

Calculate the number of litres of fuel the car used for the journey of 320 km.

Answer(b)(ii) .... litres [2]

(iii) Calculate the cost per litre of fuel used for the journey of 320 km.

Answer(b)(iii) $.................................... [2]

(c) Ellie drives a car at a constant speed of 30 m/s correct to the nearest 5 m/s.
She maintains this speed for 5 minutes correct to the nearest 10 seconds.

Calculate the upper bound of the distance in **kilometres** that Ellie could have travelled.

Answer(c) .... km [5]

February/March 2015 (42)

1   Jaideep builds a house and sells it for $450 000.

(a) He pays a tax of 1.5% of the selling price of the house.

Show that he pays $6750 in tax.

Answer(a)

[1]

(b) $6750 is 12.5% more than the tax Jaideep paid on the first house he built.

Calculate the tax Jaideep paid on the first house he built.

Answer(b) $.................................... [3]

(c) The house is built on a rectangular plot of land, 21 m by 17 m, both correct to the nearest metre.

Calculate the upper bound for the area of the plot.

Answer(c) .... m² [2]

(f) Jaideep changes $12 000 into euros (€) to buy land in another country.
The exchange rate is €1 = $1.33 .

Calculate the number of euros Jaideep receives.
Give your answer correct to the nearest euro.

Answer(f) €.................................... [3]
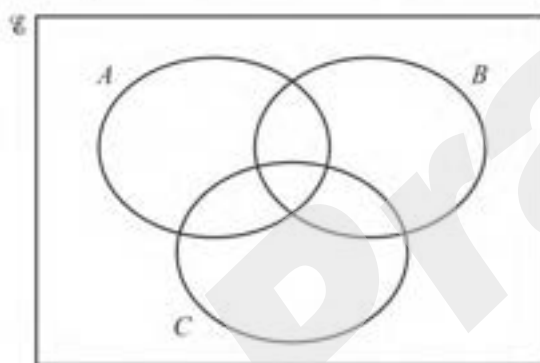
2   (a) x is an integer.

$\mathcal{E} = \{x: 1 \leqslant x \leqslant 10\}$

$A = \{x: x$ is a factor of $12\}$

$B = \{x: x$ is an odd number$\}$

$C = \{x: x$ is a prime number$\}$

(i)   Complete the Venn diagram to show this information.

[3]

(ii)   Use set notation to complete each statement.

6 .... A

$A \cap B \cap C = $ ....

$A \cap A' = $ ....   [3]

(iii)   Find n(B).

Answer(a)(iii) .... [1]

(b)
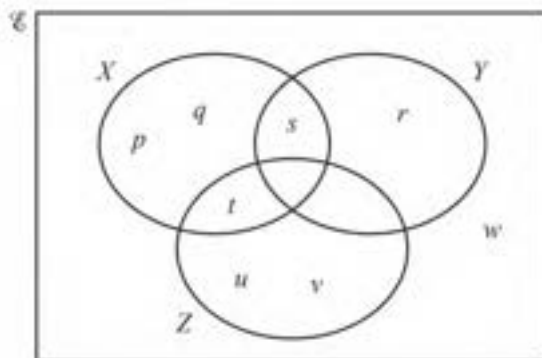
(i) Use set notation to complete the statement.

$$\{u, v\} \text{..................} Z$$

[1]

(ii) Shade $X \cap (Z \cup Y)'$.

[1]

May/June 2015 (41)

1 12 000 vehicles drive through a road toll on one day.
   The ratio   cars : trucks : motorcycles $= 13 : 8 : 3$.

   (a) (i) Show that 6500 cars drive through the road toll on that day.

   Answer(a)(i)

[1]

(ii) Calculate the number of trucks that drive through the road toll on that day.

Answer(a)(ii) .... [1]

(b) The toll charges in 2014 are shown in the table.

Vehicle	Charge
Cars	$2
Trucks	$5
Motorcycles	$1

Show that the total amount paid in tolls on that day is $34 500.

Answer(b)

[2]

(c) This total amount is a decrease of 8% on the total amount paid on the same day in 2013.

Calculate the total amount paid on that day in 2013.

Answer(c) $.. [3]

(d) 2750 of the 6500 car drivers pay their toll using a credit card.

Write down, in its simplest terms, the fraction of car drivers who pay using a credit card.

Answer(d) .... [2]

(e) To the nearest thousand, 90 000 cars drive through the road toll in one week.

Write down the lower bound for this number of cars.

Answer(e) .... [1]

May/June 2015 (42)

1   (a) Last year a golf club charged $1650 for a family membership.
          This year the cost increased by 12%.

          Calculate the cost of a family membership this year.

                                              Answer(a) $ .... [2]

     (b) The golf club runs a competition.
          The total prize money is shared in the ratio   1st prize : 2nd prize = 9 : 5.
          The 1st prize is $500 more than the 2nd prize.

          (i)   Calculate the total prize money for the competition.

                                              Answer(b)(i) $ .... [2]

          (ii) What percentage of the total prize money is given as the 1st prize?

                                              Answer(b)(ii) .... % [1]

(c) For the members of the golf club the ratio   men : children = 11 : 2.
The ratio   women : children = 10 : 3.

   (i) Find the ratio   men : women.

Answer(c)(i) .... : .... [2]

   (ii) The golf club has 24 members who are children.

       Find the total number of members.

Answer(c)(ii) .... [3]

(d) The club shop sold a box of golf balls for $20.40 .
The shop made a profit of 20% on the cost price.

Calculate the cost price of the golf balls.

Answer(d) $ .... [3]

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<u>May/June 2015 (43)</u>

2   (a)   (i)   Eduardo invests $640 at a rate of 2% per year compound interest.

Show that, at the end of 6 years, Eduardo has $721, correct to the nearest dollar.

Answer(a)(i)

[2]

(ii)   Manuela also invests $640.
At the end of 4 years, Manuela has $721.

Find the yearly compound interest rate.

Answer(a)(ii) .... % [4]

(b) Carlos buys a motor scooter for $1200.
Each year the value of the scooter decreases by 10% of its value at the beginning of that year.

Find the value of the scooter after 3 years.

Answer(b) $ .... [2]

October/November 2015 (41)

1 **(a)** Luc is painting the doors in his house.
He uses $\frac{3}{4}$ of a tin of paint for each door.

Work out the least number of tins of paint Luc needs to paint 7 doors.

Answer(a) .... [3]

(b) Jan buys tins of paint for $17.16 each.
He sells the paint at a profit of 25%.

For how much does Jan sell each tin of paint?

Answer(b) $ .... [2]

(c) The cost of $17.16 for each tin of paint is 4% more than the cost in the previous year.

Work out the cost of each tin of paint in the previous year.

Answer(c) $ .... [3]

(d) In America a tin of paint costs $17.16 .
In Italy the same tin of paint costs €13.32 .
The exchange rate is $1 = €0.72 .

Calculate, in dollars, the difference in the cost of the tin of paint.

Answer(d) $ .... [2]

(f) The mass of a tin of paint is 890 grams, correct to the nearest 10 grams.

Work out the upper bound of the total mass of 10 tins of paint.

Answer(f) .... g [1]

October/November 2015 (42)

1   A film company uses 512 actors in a film.
    The actors are in the ratio   men : women : children = 7 : 11 : 14.

    (a) (i) Show that there are 224 children in the film.

             Answer(a)(i)

                                                                                    [2]

        (ii) Find the number of men in the film.

             Answer(a)(ii) .... [1]

    (b) Every working day, each child is given $1 to spend.
        Each child works for 45 days.

        Calculate the total amount that the film company gives the children to spend.
        Give your answer correct to the nearest $100.

             Answer(b) $.. [2]

    (c) The children have lessons every day in groups of no more than 12.

        Calculate the smallest possible number of groups.

             Answer(c) .... [2]

    (d) The film costs four million and ninety three thousand dollars to make.

        (i) Write this number in figures.

             Answer(d)(i) .... [1]

        (ii) Write your answer to **part (d)(i)** in standard form.

             Answer(d)(ii) .... [1]

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(e) A DVD copy of the film costs $2.75 to make.
The selling price is $8.20 .

Calculate the percentage profit.

Answer(e) .... % [3]

October/November 2015 (43)

1 (a) Kolyan buys water for $2.60 .
He also buys biscuits.

(i) The ratio   cost of biscuits : cost of water = 3 : 2.

Find the cost of the biscuits.

Answer(a)(i) $.. [2]

(ii) Kolyan has $9 to spend.

Work out the total amount Kolyan spends on water and biscuits as a fraction of the $9.
Give your answer in its lowest terms.

Answer(a)(ii) .... [2]

(iii) The \$9 is 62.5% less than the amount Kolyan had to spend last week.

Calculate the amount Kolyan had to spend last week.

Answer(a)(iii) \$... [3]

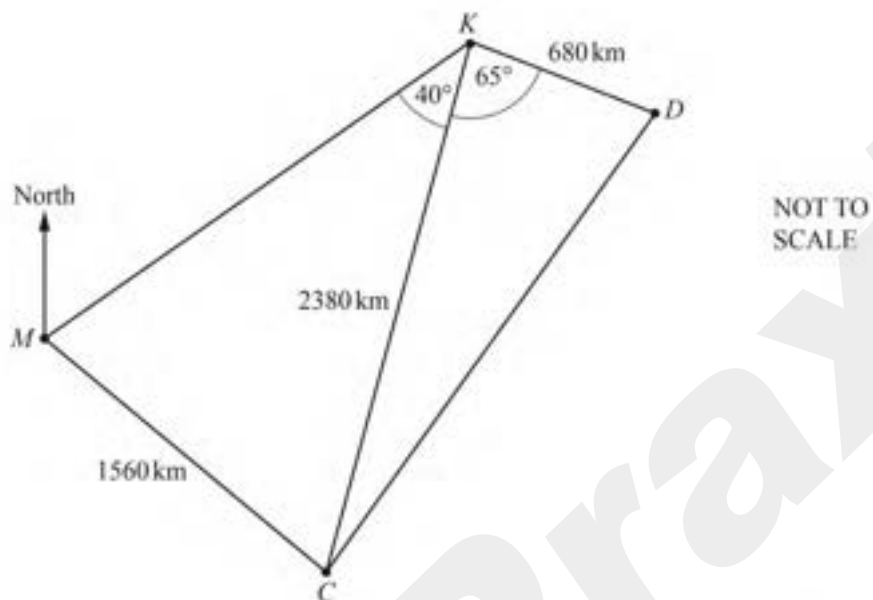(b) Priya buys a bicycle for \$250.
Each year the value of the bicycle decreases by 8% of its value at the beginning of that year.

Calculate the value of Priya's bicycle after 10 years.
Give your answer correct to the nearest dollar.

Answer(b) \$... [3]

5

The diagram shows some distances between Mumbai (*M*), Kathmandu (*K*), Dhaka (*D*) and Colombo (*C*).

(d) A plane from Colombo to Mumbai leaves at 21 15 and the journey takes 2 hours 24 minutes.

(i) Find the time the plane arrives at Mumbai.

Answer(d)(i) .... [1]

(ii) Calculate the average speed of the plane.

Answer(d)(ii) .... km/h [2]