1 Tickets for the theatre cost either $10 or $16.

(a) Calculate the total cost of 197 tickets at $10 each and 95 tickets at $16 each. [1]

(b) On Monday, 157 tickets at $10 and n tickets at $16 were sold. The total cost was $4018. Calculate the value of n. [2]

(c) On Tuesday, 319 tickets were sold altogether. The total cost was $3784.
Using x for the number of $10 tickets sold and y for the number of $16 tickets sold, write down two equations in x and y.

Solve your equations to find the number of $10 tickets and the number of $16 tickets sold. [5]

(d) On Wednesday, the cost of a $16 ticket was reduced by 15%. Calculate this new reduced cost. [2]

(e) The $10 ticket costs 25% more than it did last year. Calculate the cost last year. [2]

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1 (a) At an athletics meeting, Ben's time for the 10 000 metres race was 33 minutes exactly and he finished at 15 17.

(i) At what time did the race start? [1]

(ii) What was Ben's average speed for the race? Give your answer in kilometres per hour. [2]

(iii) The winner finished 51.2 seconds ahead of Ben.
How long did the winner take to run the 10 000 metres? [1]

(b) The winning distance in the javelin competition was 80 metres.
Otto's throw was 95% of the winning distance.
Calculate the distance of Otto's throw. [2]

(c) Pamela won the long jump competition with a jump of 6.16 metres.
This was 10% further than Mona's jump.
How far did Mona jump? [2]

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1 Hassan sells fruit and vegetables at the market.

(a) The mass of fruit and vegetables he sells is in the ratio
fruit : vegetables = 5 : 7.
Hassan sells 1.33 **tonnes** of vegetables.
How many **kilograms** of fruit does he sell? [3]

(b) The amount of money Hassan receives from selling fruit and vegetables is in the ratio
fruit : vegetables = 9 : 8.
Hassan receives a **total** of $765 from selling fruit and vegetables.
Calculate how much Hassan receives from selling fruit. [2]

(c) Calculate the average price of Hassan's fruit, in dollars per kilogram. [2]

(d) (i) Hassan sells oranges for $0.35 per kilogram.
He reduces this price by 40%.
Calculate the new price per kilogram. [2]

(ii) The price of $0.35 per kilogram of oranges is an increase of 25% on the previous day's price.
Calculate the previous day's price. [2]

1 Fatima and Mohammed each buys a bike.

   (a) Fatima buys a city-bike which has a price of $120.
      She pays 60% of this price and then pays $10 per month for 6 months.

      (i) How much does Fatima pay altogether? [2]

      (ii) Work out your answer to **part (a)(i)** as a percentage of the original price of $120. [2]

   (b) Mohammed pays $159.10 for a mountain-bike in a sale.
      The original price had been reduced by 14%.
      Calculate the original price of the mountain-bike. [2]

   (c) Mohammed's height is 169 cm and Fatima's height is 156 cm.
      The frame sizes of their bikes are in the same ratio as their heights.
      The frame size of Mohammed's bike is 52 cm.
      Calculate the frame size of Fatima's bike. [2]

   (d) Fatima and Mohammed are members of a school team which takes part in a bike ride for charity.

      (i) Fatima and Mohammed ride a total distance of 36 km.
      The ratio distance Fatima rides : distance Mohammed rides is 11 : 9.
      Work out the distance Fatima rides. [2]

      (ii) The distance of 36 km is only $\frac{2}{23}$ of the total distance the team rides.

      Calculate this total distance. [2]

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(c) Pamela won the long jump competition with a jump of 6.16 metres.
This was 10% further than Mona's jump.
How far did Mona jump? [2]

(a) Write the ratio   Adults : Children   in its lowest terms. [2]

(b) At the first stop, $37\frac{1}{2}\%$ of the adults and $\frac{1}{3}$ of the children get off the train.
20 adults and x children get onto the train.
The total number of passengers on the train is now 200.

    (i) How many children got off the train? [1]

    (ii) How many adults got off the train? [1]

    (iii) How many **adult** passengers are **on** the train as it sets off again? [1]

    (iv) What is the value of x? [1]

(c) After a second stop, there are 300 passengers on the train and the ratio

    Men : Women : Children   is 6 : 5 : 4.

Calculate the number of children now on the train. [2]

(d) On Tuesday the train journey took 7 hours and 20 minutes and began at 13 53.

    (i) At what time did the train journey end? [1]

    (ii) Tuesday's time of 7 hours 20 minutes was 10% more than Monday's journey time.
    How many minutes longer was Tuesday's journey? [2]

The population of Newtown is 45 000.
The population of Villeneuve is 39 000.

    (a) Calculate the ratio of these populations in its simplest form. [1]

    (b) In Newtown, 28% of the population are below the age of twenty.
    Calculate how many people in Newtown are below the age of twenty. [2]

    (c) In Villeneuve, 16 000 people are below the age of twenty.
    Calculate the percentage of people in Villeneuve below the age of twenty. [2]

    (d) The population of Newtown is 125% **greater** than it was fifty years ago.
    Calculate the population of Newtown fifty years ago. [2]

    (e) The two towns are combined and made into one city called Monocity.
    In Monocity the ratio of
                  men : women : children   is   12 : 13 : 5.
    Calculate the number of children in Monocity. [2]

1 A Spanish family went to Scotland for a holiday.

(a) The family bought 800 pounds (£) at a rate of £1 = 1.52 euros (€).
How much did this cost in euros? [1]

(b) The family returned home with £118 and changed this back into euros.
They received €173.46.
Calculate how many euros they received for each pound. [1]

(c) A toy which costs €11.50 in Spain costs only €9.75 in Scotland.
Calculate, as a percentage of the cost in Spain, how much **less** it costs in Scotland. [2]

(d) The total cost of the holiday was €4347.00.
In the family there were 2 adults and 3 children.
The cost for one adult was double the cost for one child.
Calculate the cost for one child. [2]

(e) The **original** cost of the holiday was **reduced** by 10% to €4347.00.
Calculate the original cost. [2]

(f) The plane took 3 hours 15 minutes to return to Spain.
The length of this journey was 2350 km.
Calculate the average speed of the plane in

   (i) kilometres per hour, [2]

   (ii) metres per second. [1]

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1 **(a)** The scale of a map is 1:20 000 000.

On the map, the distance between Cairo and Addis Ababa is 12 cm.

   (i) Calculate the distance, in kilometres, between Cairo and Addis Ababa. [2]

   (ii) On the map the area of a desert region is 13 square centimetres.

   Calculate the actual area of this desert region, in square kilometres. [2]

(b) **(i)** The actual distance between Cairo and Khartoum is 1580 km.

   On a different map this distance is represented by 31.6 cm.

   Calculate, in the form $1:n$, the scale of this map. [2]

   (ii) A plane flies the 1580

   It departs from Cairo at 11 55 and arrives in Khartoum at 14

   Calculate the average speed of the plane, in kilometres per hour. [4]

1   Vreni took part in a charity walk.
    She walked a distance of 20 kilometres.

    (a) She raised money at a rate of $12.50 for each kilometre.

        (i)   How much money did she raise by walking the 20 kilometres?   [1]

        (ii) The money she raised in **part (a)(i)** was $\frac{5}{52}$ of the total money raised.

                  Work out the total money raised.   [2]

        (iii) In the previous year the total money raised was $2450.
                  Calculate the percentage increase on the previous year's total.   [2]

    (b) Part of the 20 kilometres was on a road and the rest was on a footpath.
            The ratio   road distance : footpath distance   was   3:2.

        (i)   Work out the road distance.   [2]

        (ii) Vreni walked along the road at 3 km/h and along the footpath at 2.5 km/h.
                  How long, in hours and minutes, did Vreni take to walk the 20 kilometres?   [2]

        (iii) Work out Vreni's average speed.   [1]

        (iv) Vreni started at 08 55. At what time did she finish?   [1]

    (c) On a map, the distance of 20 kilometres was represented by a length of 80 centimetres.
            The scale of the map was 1 n
            Calculate the value of n.   [2]

1   Marcus receives $800 from his grandmother.

    (a) He decides to spend $150 and to divide the remaining $650 in the ratio

                                savings : holiday = 9 : 4.

        Calculate the amount of his savings.

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

    (b) **(i)** He uses 80% of the $150 to buy some clothes.

             Calculate the cost of the clothes.

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

        (ii) The money remaining from the $150 is $37\frac{1}{2}$% of the cost of a day trip to Cairo.

             Calculate the cost of the trip.

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

    (c) **(i)** Marcus invests $400 of his savings for 2 years at 5% per year **compound** interest.

             Calculate the amount he has at the end of the 2 years.

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]

In 1950, the population of Switzerland was 4 714 900.
In 2000, the population was 7 087 000.

(a) Work out the percentage increase in the population from 1950 to 2000.

Answer (a)... % [2]

(b) (i) Write the 1950 population correct to 3 significant figures.

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

(ii) Write the 2000 population in standard form.

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

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
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
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]

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]

1   Maria, Carolina and Pedro receive $800 from their grandmother in the ratio

Maria: Carolina: Pedro = 7:5:4.

(a) Calculate how much money each receives. [3]

(b) Maria spends $\frac{2}{7}$ of her money and then invests the rest for two years

at 5% per year simple interest.
How much money does Maria have at the end of the two years? [3]

(c) Carolina spends all of her money on a hi-fi set and two years later sells it at a loss of 20%.
How much money does Carolina have at the end of the two years? [2]

(d) Pedro spends some of his money and at the end of the two years he has $100.
Write down and simplify the ratio of the amounts of money Maria, Carolina and Pedro have at
the end of the two years. [2]

(e) Pedro invests his $100 for two years at a rate of 5% per year **compound interest**.
Calculate how much money he has at the end of these two years. [2]

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1   Each year a school organises a concert.

(a) **(i)** In 2004 the cost of organising the concert was $385.

In 2005 the cost was 10% less than in 2004.

Calculate the cost in 2005. [2]

(ii) The cost of $385 in 2004 was 10% more than the cost in 2003.

Calculate the cost in 2003. [2]

(b) **(i)** In 2006 the number of tickets sold was 210.

 Number of adult tickets : Number of student tickets was   23 : 19.

How many adult tickets were sold? [2]

(ii) Adult tickets were $2.50 each and student tickets were $1.50 each.

Calculate the **total** amount **received** from selling the tickets. [2]

(iii) In 2006 the cost of organising the concert was $410.

Calculate the percentage profit in 2006. [2]

(c) In 2007, the number of tickets sold was again 210.

Adult tickets were $2.60 each and student tickets were $1.40 each.

The total amount received from selling the 210 tickets was $480.

How many student tickets were sold? [4]

1 Beatrice has an income of $40 000 in one year.

(a) She pays:

no tax on the first $10 000 of her income;

10% tax on the next $10 000 of her income;

25% tax on the rest of her income.

Calculate

(i) the total amount of tax Beatrice pays, [2]

(ii) the total amount of tax as a percentage of the $40 000. [2]

(b) Beatrice pays a yearly rent of $10 800.

After she has paid her tax, rent and bills, she has $12 000.

Calculate how much Beatrice spends on bills. [1]

(c) Beatrice divides the $12 000 between shopping and saving in the ratio

$$shopping : saving = 5 : 3.$$

(i) Calculate how much Beatrice spends on shopping in one year. [2]

(ii) What fraction of the original $40 000 does Beatrice **save**?

Give your answer in its lowest terms. [1]

(d) The rent of $10 800 is an increase of 25% on her previous rent.

Calculate her previous rent. [2]

In 2004 Colin had a salary of $7200.

(a) This was an increase of 20% on his salary in 2002.
Calculate his salary in 2002.

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

(b) In 2006 his salary increased to $8100.
Calculate the percentage increase from 2004 to 2006.

1   Chris goes to a shop to buy meat, vegetables and fruit.

(a) (i) The costs of the meat, vegetables and fruit are in the ratio

meat : vegetables : fruit = 2 : 2 : 3.

The cost of the meat is $2.40.

Calculate the **total** cost of the meat, vegetables and fruit.

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

(ii) Chris pays with a $20 note.

What percentage of the $20 has he spent?

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

(b) The masses of the meat, vegetables and fruit are in the ratio

meat : vegetables : fruit = 1 : 8 : 3.

The total mass is 9 kg.

Calculate the mass of the vegetables.

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

(c) Calculate the cost per kilogram of the fruit.

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

(d) The cost of the meat, $2.40, is an increase of 25% on the cost the previous week.

Calculate the cost of the meat the previous week. ....

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)

(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.

    Find the **exact** value of

    (a) 3^{-2},

Answer (a) .... [1]

    (b) $\left(1\frac{7}{9}\right)^{\frac{1}{2}}$.

Answer (b) .... [2]

    The length of a road is 380 m, correct to the nearest 10 m.
    Maria runs along this road at an average speed of 3.9 m/s.
    This speed is correct to 1 decimal place.
    Calculate the greatest possible time taken by Maria.

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)
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.

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
The total cost of 5 books and 2 pencils is $64.20.
Find the cost of one pencil.