WORKSHEET

Repeated percentage change

1 What percentage change is equivalent to:

   a an increase of 7% followed by a decrease of 7%?

   b a decrease of 15% followed by an increase of 15%?

   c an increase of 10% followed by a decrease of 6%?

   d an increase of 15% followed by another increase of 20%?

   e a decrease of 20% followed by another decrease of 35%?

2 Li bought a new car for $23 000. After one year the car had decreased in value by 20%. In the following year, the car decreased in value by a further 17%.

   a Calculate the value of the car after:

      i one year

      ii two years.

   b What is the overall percentage change in the original price of Li's car?

3 An electronics store increased the prices of all laptops by 8%. During the end of year sales, all stock was discounted by 10%. A laptop originally cost $995.

   a What was the new price of the laptop after the price increase?

   b What is the price of the laptop during the end of year sales?

   c Calculate the overall percentage change in price.

   d Use your answer from part **c** to calculate the price of the laptop during the sales. Did you get the same answer as in part **b**?

4 Before starting at university, Matthew decided to improve his typing speed by doing a two week typing course. When he began, his typing speed was 21 words/min. After one week his speed had increased by 89%. In the second week, he lost interest and his speed decreased by 16%. Giving answers to the nearest whole number, calculate his typing speed:

   a at the end of the first week.

   b at the end of the second week.

5 At the Inner City Medical Centre, the average number of patients per day in May was 152. In June, this figure increased by 8%. During July, a bad flu virus spread through the city and the average number of patients per day increased by a further 23%.

   a On average, how many patients were seeing doctors at the Inner City Medical Centre per day in June? Answer to the nearest whole number.

   b What was the average number of patients seeing doctors at the clinic in July? Answer to the nearest whole number.

6 Cafe X increased all prices by 10% but then offered a 5% discount to all customers with a Cafe X loyalty card. Before the prices were changed, a coffee cost $4.50. Following the price increase, how much would a coffee cost for a customer with a loyalty card?

7 In Australia, a baby girl of average length is 49 cm long. If she remains 'average', by age 2 her height will have increased by 73%. By age 18, her height will have increased by a further 92%.

   a What is the average height of an 18-year-old female? Give your answer to the nearest centimetre.

   b What is the overall percentage change in height between birth and 18 years of age for a female of average height?

8 Marco went on a weight-loss diet. Initially, his weight was 92.5 kg. In the first month, he reduced his weight by 1.7%. In the second month, his weight decreased by 2.9%.

   a As a percentage of his initial weight, what was Marco's overall loss of weight over the two months? Answer correct to two decimal places.

   b What was Marco's weight after two months of dieting? Answer to one decimal place.

9 Deana has an online store. In 2009, she made a profit of $13 900. Over the next two years, she put a lot of effort into promoting her business and her profit increased by 35% in 2010, and then by 62% in 2011.

   a What profit did she make in 2011?

   b What is the overall percentage increase in profit that Deana made over 2010 and 2011?

10 After months of rain, the Clareville dam was full. Over the next year, the amount of water in the dam decreased by 16%. The following year it increased by 5%. What was the overall percentage change in the amount of water in Clareville dam?

11 At an intersection on a busy road, the number of accidents in 2010 was 35. In 2011 this increased by 20%. At the start of 2012, a set of traffic lights was put in at the intersection and the number of accidents decreased by 69%. How many accidents were there at the intersection in 2012? Answer to the nearest whole number.

12 All stock was reduced by a further 50%.

    a What was the overall percentage change in price?

    b A clock had originally been priced at $49.95. What is its price after the second reduction?

13 At the start of 2012, the number of students at Craggy High School was 614. Over the course of the year the student population decreased by 4%. At the start of 2013, the number of students at Craggy High increased by 33% due to the closure of a neighbouring school. How many students were enrolled in Craggy High at the start of 2013? Answer to the nearest whole number.

Answers

1 **a** 0.49% decrease

   b 2.25% decrease

   c 3.4% increase

   d 38% increase

   e 48% decrease

2 **a i** $18\,400

   ii $15\,272

   b 33.6% decrease

3 **a** $1074.60

   b $967.14

   c 2.8% decrease

   d $100\% - 2.8\% = 97.2\%$; $97.2\% \times \$995 = \$967.14$ Yes

4 **a** 40 words/min

   b 33 words/min

5 **a** 164

   b 202

6 $4.70

7 **a** 163 cm

   b 232.16% increase

8 **a** 4.55%

   b 88.3 kg

9 **a** $30\,399.30

   b 118.7%

10 11.8% decrease

11 13

12 **a** 62.5% decrease

   b $18.73

13 784