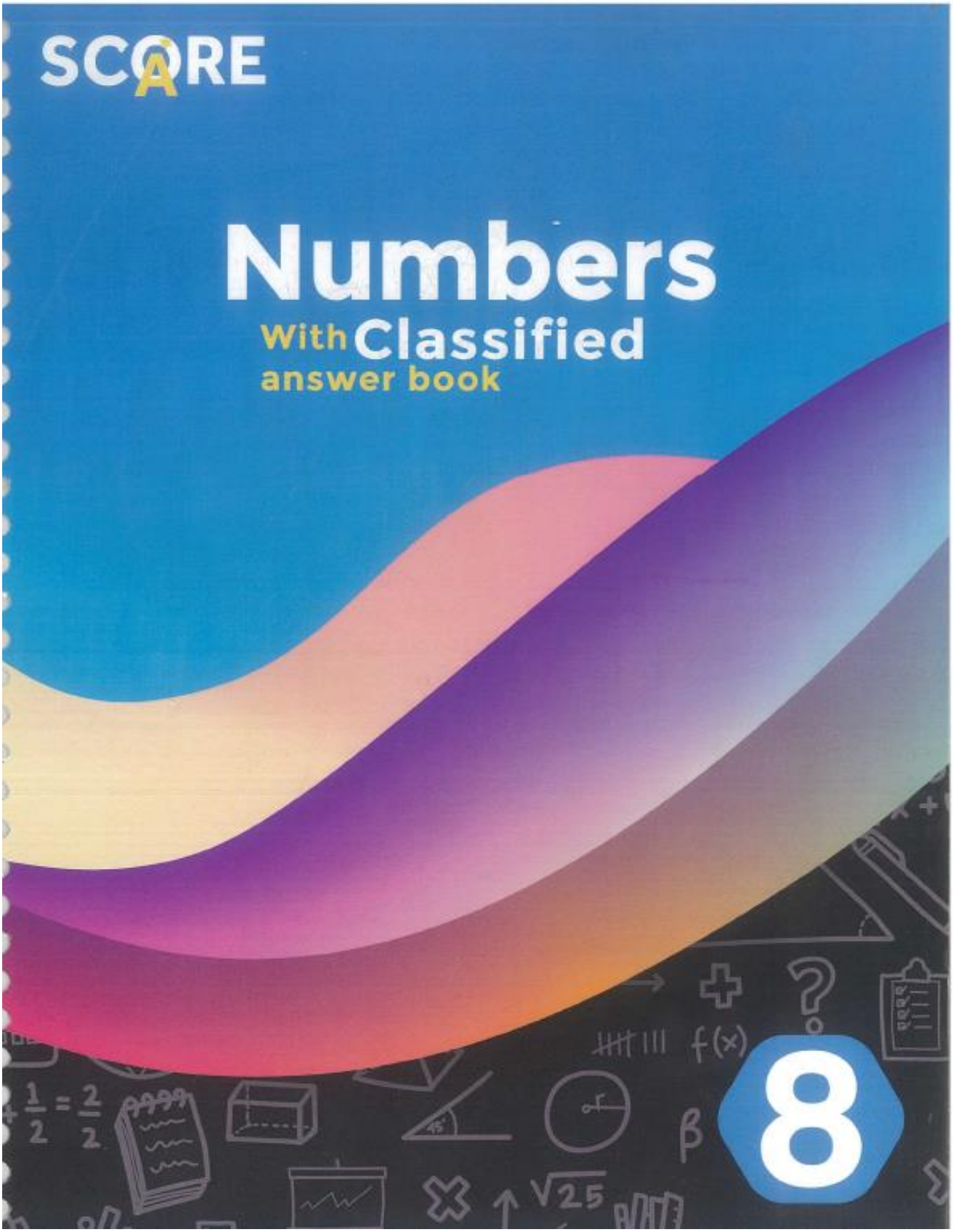
Classified – Compound Percentage

P. 104 to p. 108



18- Compound Percentages

1. a. Work out these compound percentage changes.

i. 200 increased by 10%, then decreased by 10%

ii. 200 decreased by 10%, then increased by 10%

b. Which is greater from this sentence?

200 increased by 10%, then decreased by 10%
or
200 decreased by 10%, then increased by 10%

c. Without doing any calculations, decide which sign, <, > or =, is missing from each sentence.

i. 40 decreased by 30%, then increased by 30% 40 increased by 30%, then decreased by 30%

ii. 156 increased by 2%, then decreased by 2% 156 decreased by 2%, then increased by 2%

2. Patsi works out the percentage increase of the price of a litre of petrol over two weeks.
In the first week, the price of a litre of petrol increased by 5%. In the second week, the price of a litre of petrol increased by 2%.

a. Use Mari's method from Question 6 to work out the multiplier for the compound percentage change.

b. At the start of the first week the price of a litre of petrol was $1.20.
What is the price of a litre of petrol at the end of the second week?Give your answer to the nearest cent.

3. An amount of money is increased by 8%, then decreased by 15%, then increased by 20%.

a. Write the multiplier for this percentage change.

b. The amount of money after the three percentage changes is $2643.84.
Work out the original amount of money, before the three percentage changes.

4. a. Raj uses this method to work out 50 decreased by 20%, then decreased by 10%.

$$50 \times 0.8 \times 0.9 = 36$$

Use Raj's method to work out the final value after these compound percentage decreases.

i. 80 decreased by 40%, then decreased by 30%

ii. 600 decreased by 75%, then decreased by 20%

b. Mari uses this method to work out 50 decreased by 20%, then decreased by 10%

$$0.8 \times 0.9 = 0.72 \rightarrow \quad 50 \times 0.72 = 36$$

Use Mari's method to work out the final value after these compound percentage decreases.

i. 200 decreased by 15%, then decreased by 25%

ii. 90 decreased by 10%, then decreased by 5%

5. A scooter has a value of $1800. The value of the scooter is predicted to decrease at a steady rate of 12% per year.

a. Write a calculation to work out the value of the scooter after

i 1 year

ii 2 years

iii 3 years.

b. What does the calculation $1800 \times (0.88)7$ represent?

c. What does the calculation $1800 \times (0.88)^{12}$ represent?

d. Show that the value of the scooter first falls below $1000 after 5 years.
Show how you worked out your answer.

e. Write a calculation to work out the value of the scooter after n years.

6. The number of fish in a lake is measured each year for six years.

The number of fish in the lake is found to be decreasing at a rate of 20% each year.
After 6 years, the population of fish in the lake is 131 072.
How many fish were there in the lake at the start of the first year?

7. The table shows the prices of two laptops.

Laptop A	$650
Laptop B	$760

The price of Laptop A increases by 12%.
The price of Laptop B **decreases** by 5%.

Tick (✓) to show which laptop is more expensive after these changes.

Laptop A ☐ Laptop B ☐

Show how you worked out your answer.