Growth and decay: 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes.

Section A: Consolidating (Questions 1-4)

Question 1

(a) Increase $200 by 10%.

(b) Decrease $500 by 20%.

Question 2

It takes 4 painters 6 days to paint a school building. Assuming all painters work at the same rate, how long would it take 8 painters?

Question 3

$1000 is invested at 5% p.a. interest, compounded annually. Find the value of the investment after 2 years.

Question 4

For each multiplier, state whether it shows growth or decay, and the percentage change.

(a) 1.08

(b) 0.85

(c) 1.5

(d) 0.99

Section B: Standard (Questions 5-10)

Question 5

$5000 is invested at 4% p.a. interest, compounded annually, for 3 years.

(a) Find the value of the investment after 3 years.

(b) How much interest is earned?

Question 6

$8000 is invested for 3 years at 5% p.a.

(a) Find the interest earned if simple interest is paid.

(b) Find the interest earned if the interest is compounded annually.

(c) How much more interest does compound interest earn?

Question 7

A car is bought for $32 000. Its value depreciates (decreases) by 15% each year.

(a) Write a rule for the value, V dollars, after n years.

(b) Find the value of the car after 3 years.

Question 8

A town has a population of 20 000, which is growing at 2% per year.

(a) Write a rule for the population, P, after n years.

(b) Find the population after 2 years.

Question 9

A road trip takes 3 hours at an average speed of 80 km/h. The time, t hours, is inversely proportional to the average speed, s km/h.

(a) Write a rule for t in terms of s.

(b) How long would the trip take at 60 km/h?

(c) What average speed is needed to do the trip in 2.5 hours?

Question 10

y is inversely proportional to x, and y = 12 when x = 2.

(a) Find the rule connecting y and x.

(b) Copy and complete the table.

x	**1**	**3**	**4**	**6**	**8**
y					

Growth and decay: answers

Question 1

Answer: (a) $220 (b) $400

Question 2

Answer: 3 days (4 × 6 = 24 painter days, 24 ÷ 8 = 3)

Question 3

Answer: $1102.50 ($1000 \times 1.05^2$)

Question 4

Answer: (a) growth, 8% (b) decay, 15% (c) growth, 50% (d) decay, 1%

Question 5

Answer: (a) $5624.32 ($5000 \times 1.04^3$) (b) $624.32

Question 6

Answer: (a) $1200 (b) $1261 ($8000 \times 1.05^3 = 9261$) (c) $61

Question 7

Answer: (a) $V = 32{,}000 \times 0.85^n$ (b) $19 652

Question 8

Answer: (a) $P = 20{,}000 \times 1.02^n$ (b) 20 808

Question 9

Answer: (a) t = 240/s (b) 4 hours (c) 96 km/h

Question 10

Answer: (a) y = 24/x (b) 24, 8, 6, 4, 3