Linear relations in real-life problems: 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

Solve $3x + 7 = 25$.

Question 2

A plumber charges a $60 call-out fee plus $45 for each hour of work. Write a rule for the total cost, C dollars, for a job that takes h hours.

Question 3

A taxi charges $4 when you get in plus $2.50 for each kilometre travelled. Find the cost of a 12 km trip.

Question 4

Solve $x/4 - 3 = 5$.

Section B: Standard (Questions 5-10)

Question 5

A mobile phone plan costs $20 per month plus 10 cents for each text message sent.

(a) Write a rule for the monthly cost, C dollars, when t texts are sent.

(b) Find the cost for a month in which 150 texts are sent.

(c) One month the bill was $32.50. How many texts were sent?

Question 6

A candle is 30 cm tall when it is lit. It burns down at a steady 2 cm per hour.

(a) Copy and complete the table.

Time burning, t (hours)	0	1	2	3	4	5

Height, L (cm)	30

(b) Write a rule for L in terms of t.

(c) After how many hours will the candle have burnt down completely?

Question 7

Ben invests $2000 in an account that pays simple interest of 4% per year. The interest is paid at the end of each year and is always calculated on the original $2000. Nothing is withdrawn.

(a) How much interest does Ben earn each year?

(b) Write a rule for the amount in the account, A dollars, after t years.

(c) How much is in the account after 5 years?

(d) After how many years will the account hold $2560?

Question 8

Gym A charges a $50 joining fee plus $15 per week. Gym B has no joining fee and charges $20 per week.

(a) Find the total cost of each gym for 8 weeks.

(b) After how many weeks do the two gyms cost the same total amount?

(c) Which gym is cheaper for a full year of 52 weeks, and by how much?

Question 9

Sam thinks of a number. He multiplies it by 5 and then subtracts 8. The result is 37. Write an equation and solve it to find Sam's number.

Question 10

The length of a rectangle is 4 cm more than its width. The perimeter of the rectangle is 44 cm. Let the width be w cm.

(a) Write an equation for the perimeter in terms of w.

(b) Solve the equation and state the length and width of the rectangle.

Linear relations in real-life problems: answers

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Question 1

Answer: x = 6 (3x = 18)

Question 2

Answer: C = 60 + 45h (also accept C = 45h + 60)

Question 3

Answer: $34 (4 + 2.50 × 12)

Question 4

Answer: x = 32 (x/4 = 8)

Question 5

Answer: (a) C = 20 + 0.1t (also accept C = 0.10t + 20) (b) $35 (c) 125 texts (0.1t = 12.5)

Question 6

Answer: (a) 30, 28, 26, 24, 22, 20 (b) L = 30 - 2t (c) 15 hours

Question 7

Answer: (a) $80 (b) A = 2000 + 80t (c) $2400 (d) 7 years (560 ÷ 80)

Question 8

Answer: (a) Gym A $170, Gym B $160 (b) 10 weeks (50 + 15w = 20w) (c) Gym A, by $210 (A $830, B $1040)

Question 9

Answer: 5n - 8 = 37, so n = 9

Question 10

Answer: (a) 2(w + w + 4) = 44 (or 4w + 8 = 44) (b) w = 9: width 9 cm, length 13 cm