Substituting and rearranging formulas: 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes. Use the π key on your calculator unless a question says otherwise.

Section A: Consolidating (Questions 1-4)

Question 1

Substitute the given values to evaluate each formula.

(a) P = 2l + 2w when l = 7 and w = 3

(b) v = u + at when u = 4, a = 3 and t = 5

Question 2

(a) Use E = ½mv² to find E when m = 4 and v = 3.

(b) Use F = 9C/5 + 32 to find F when C = 25.

Question 3

Make x the subject of each formula.

(a) y = x + 7

(b) y = 5x

(c) y = x/3

Question 4

Make the letter in brackets the subject.

(a) d = st quad [t]

(b) P = 4s quad [s]

(c) A = P + I quad [P]

Section B: Standard (Questions 5-10)

Question 5

(a) Use v = u + at to find a when v = 30, u = 6 and t = 8.

(b) Use $A = \frac{1}{2}bh$ to find h when $A = 36$ and $b = 9$.

Question 6

Make the letter in brackets the subject.

(a) $y = 3x - 4 \quad [x]$

(b) $P = 2l + 2w \quad [l]$

(c) $C = 2\pi r \quad [r]$

Question 7

Make the letter in brackets the subject.

(a) $A = \frac{(a + b)h}{2} \quad [h]$

(b) $m = \frac{x + y}{2} \quad [y]$

(c) $F = \frac{9C}{5} + 32 \quad [C]$

Question 8

Make the letter in brackets the subject. Assume all letters stand for positive numbers.

(a) $A = \pi r^2 \quad [r]$

(b) $E = mc^2 \quad [c]$

(c) $V = s^3 \quad [s]$

Question 9

Use your answer to Question 7(c) to convert each temperature to degrees Celsius.

(a) $86°F$

(b) $212°F$

Question 10

A taxi fare, C dollars, for a trip of d km is given by $C = 3.60 + 2.20d$.

(a) Find the fare for a 15 km trip.

(b) Make d the subject of the formula.

(c) A fare is $47.60. How long was the trip?

Substituting and rearranging formulas: answers

Question 1

Answer: (a) 20 (b) 19

Question 2

Answer: (a) 18 (b) 77

Question 3

Answer: (a) $x = y - 7$ (b) $x = y/5$ (c) $x = 3y$

Question 4

Answer: (a) $t = d/s$ (b) $s = P/4$ (c) $P = A - I$

Question 5

Answer: (a) $a = 3$ ($30 = 6 + 8a$) (b) $h = 8$ ($36 = 4.5h$)

Question 6

Answer: (a) $x = (y + 4)/(3)$ (b) $l = (P - 2w)/(2)$ (also accept $l = P/2 - w$) (c) $r = (C)/(2\pi)$

Question 7

Answer: (a) $h = (2A)/(a + b)$ (b) $y = 2m - x$ (c) $C = (5(F - 32))/(9)$ (also accept $C = 5/9(F - 32)$)

Question 8

Answer: (a) $r = \sqrt{((A)/(\pi))}$ (b) $c = \sqrt{(E/m)}$ (c) $s = \sqrt[3]{V}$

Question 9

Answer: (a) 30°C (b) 100°C

Question 10

Answer: (a) $36.60 (b) $d = (C - 3.60)/(2.20)$ (c) 20 km ($(44)/(2.20)$)