



Substitution Exam Practice

- Q1. Given that $a = 7$ and $b = 5$, work out the value of $3a + 2b$
(2 marks)
- Q2. Given that $a = -3$ and $b = -10.5$, work out the value of $4a - 7b$
(2 marks)
- Q3. Given that $a = 7$, $b = -1$ and $c = 8$, work out the value of $3a^2 + bc$
(2 marks)
- Q4. Here is a formula: $M = \sqrt{2d} + 4e$.
Work out the value of M if $d = 8$, $e = -1$
(2 marks)
- Q5. Here is a formula: $F = \frac{4a+b}{3b}$.
Work out the value of F if $a = -2$, $b = 12$ simplifying your answer fully.
(2 marks)
- Q6. Here is a formula: $R = 3p + (q - r)^2$
Work out the value of R if $p = 2$, $q = 12$, and $r = 20$
(2 marks)
- Q7. Given the formula $F = \frac{a+2}{b}$, suggest two values for a and b so that the value of F will be greater 4 and less than 7.
(2 marks)
- Q8. Given that $a = \frac{1}{2}$ and $b = \frac{3}{4}$, work out the value of $A = \frac{3(a+b)^2}{6a+6b}$
(2 marks)
- Q9. Given that $u = 2\pi$ and $v = \pi$, work out, and simplify, the value of $B = u^2 + 4v - uv$. Leave your answer in terms of π .
(2 marks)
- Q10. Given that $c = 0.1$, $d = 0.3$, and $e = -0.4$, find the value of H which has formula, $H = \frac{1000}{\frac{c}{d} + \frac{e}{d}}$
(2 marks)
- Q11. Here is a formula: $S = ut + \frac{1}{2}at^2$
Work out the value of S if $u = 20$, $t = 4$, and $a = -9.8$
(2 marks)



Applied Mixed Practice Problems

Q12. Here is a formula: $F = \sqrt{a - 2b}$

Joe wishes to substitute two sets of numbers into the formula:

Set 1:

$$a = 5, b = 3$$

Set 2:

$$a = 3, b = -8$$

Which of these sets is unsuitable for him to substitute? Explain your reasoning.

(2 marks)

Q13. Here is a formula to convert between temperatures measured in °C and °F: $F = 32 + \frac{9}{5}C$

a) Use the formula to convert 50 °F to °C

(2 marks)

b) Use the formula to convert 20 °C to °F

(1 mark)

Q14. Here is a formula on a spreadsheet: $T = b^2 - a^2$.

Mike will use it to enter numbers sets of numbers a and b. He claims that if he only enters numbers such that $b > a$, he will never get any negative results from the formula.

Do you agree? You must justify your reasoning.

(2 marks)

Q15. At a company, staff are put into different bands according to experience. The minimum sales target per month is shown below:

<u>Band:</u>	<u>Items sold:</u> (100's)
A	5
B	7
C	8

The monthly pay P (£) for sales staff is worked out using the formula:
 $P = 1100 - 2.5(M - N)$ where N = no. sales made and M = the minimum target no. of sales.

(i) Gary is in band B and sells 750 items. Work out his monthly pay.

(2 marks)

(ii) Mary sells 285 items. Work out which bands, if any, she could be in and still earn more than £1000. Show all your working out.

(2 marks)