



## Substitution Exam Practice

Q1. Given that  $a = 7$  and  $b = 5$ , work out the value of  $3a + 2b$

Answer: \_\_\_\_\_  
(2 marks)

Q2. Given that  $a = -3$  and  $b = -10$ , work out the value of  $4a - 7b$

Answer: \_\_\_\_\_  
(2 marks)



Q3. Given that  $a = 7$ ,  $b = -1$  and  $c = 8$ , work out the value of  $3a^2 + bc$

Answer: \_\_\_\_\_  
(2 marks)

Q4. Here is a formula:  $M = \sqrt{2d} + 4e$ .  
Work out the value of M if  $d = 8$ ,  $e = -1$

Answer: \_\_\_\_\_  
(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.

Answer: \_\_\_\_\_  
(2 marks)

Q6. Here is a formula:  $R = 3p + (q - r)^2$

Work out the value of R if  $p = 2$ ,  $q = 12$ , and  $r = 20$

Answer: \_\_\_\_\_  
(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.

Answer: \_\_\_\_\_  
(2 marks)

Q8. Given that  $a = \frac{1}{2}$  and  $b = \frac{3}{4}$ , work out the value of  $A = \frac{3(a+b)^2}{6a+6b}$

Answer: \_\_\_\_\_  
(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  $\pi$ .

Answer: \_\_\_\_\_  
(2 marks)

Q10. Given that  $c = 0.1$ ,  $d = 0.3$ , and  $e = -0.4$ , find the value of  $H$  which has formula,  $H = \frac{1000}{\frac{c}{d} + \frac{e}{d}}$

Answer: \_\_\_\_\_  
(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  $a = -9.8$

Answer: \_\_\_\_\_  
(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:                      Set 2:  
 $a = 5, b = 3$        $a = 3, b = -8$

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

Answer: \_\_\_\_\_  
(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

Answer: \_\_\_\_\_  
(2 marks)

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

Answer: \_\_\_\_\_  
(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.

Answer: \_\_\_\_\_  
(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: (100's)</u>
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.

Answer: \_\_\_\_\_  
(2 marks)

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

Answer: \_\_\_\_\_  
(2 marks)