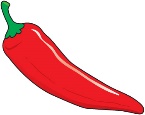
**Q1.** (a) Given that

where is a positive constant, show that .

**(3)**

(b) Write down the value of:

(i) ;

**(1)**

(ii)  ;

**(1)**

(iii) ;

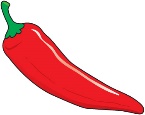
**(1)**

(iv)  .

**(1)**

**(Total 7 marks)**

**Q2.** Find the value of

 **(Total 2 marks)**

**Q3.** (a) Given that

show that .

**(3)**

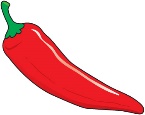
(b) Given that

expressin terms of *,* giving your answer in a form not involving logarithms.

**(3)**

**(Total 6 marks)**

**Q4.** (a) Write down the value of:

(i) ;

**(1)**

(ii)  .

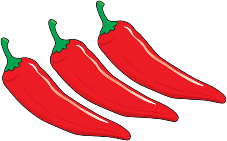
**(1)**

(b) Given that

find the value of *x*.

**(3)**

**(Total** **5** **marks)**

**Q5.** (a) It is given that satisfies the equation

Find the value of .

**(3)**

(b) Given that

and

(i) express in terms of ;

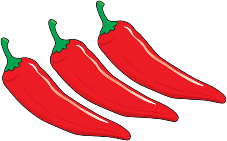
**(1)**

(ii) express in terms of .

**(4)**

**(Total 8 marks)**

**Q6.** (a) Given that

write down the value of .

**(1)**

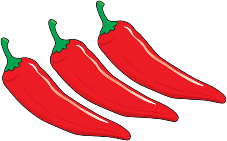
(b) Given that

express in terms of , giving your answer in a form **not** involving logarithms.

**(3)**

**(Total** **4** **marks)**

**Q7.** (a) (i) Find the value of *p* for which .

**(2)**

(ii) Hence solve the equation .

**(1)**

(b) Use logarithms to solve the equation

giving your value of to four decimal places.

**(3)**

(c) It is given that

Express in terms of , giving your answer in a form not involving logarithms.

**(4)**

**(Total 10 marks)**

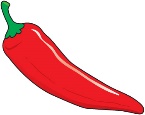
**Q8.** (a) Write each of the following in the form , where

is an integer:

(i)  ;

**(1)**

(ii)  ;

 **(1)**

(iii) .

**(1)**

(b) Use logarithms to solve the equation ,

giving your value of to three decimal places.

**(3)**

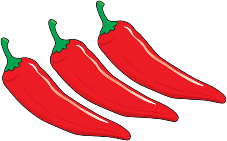
(c) Given that and , express in the

form , where is an expression in and .

**(3)**

**(Total 9 marks)**

**Q9.** (a) Find the value of in each of the following:

 (i)  ;

**(1)**

(ii) .

**(1)**

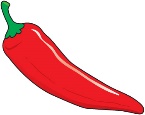
(b) Given that

find the possible values of .

**(5)**

**(Total 7 marks)**

**Q10.** Given that



express in terms of and , giving your answer in a form

not involving logarithms.

**(Total 3 marks)**

**Q11.** (a) Given that , express in terms of and .

**(1)**

(b) By forming a quadratic equation, show that there is

only one value of which satisfies the equation

**(6)**

**(Total 7 marks)**

**Q12.** (a) Given that

,

express in terms of . Give your answer in a form not

involving logarithms.

**(4)**

(b) Given that and that , show

that , where is an expression in terms of .

**(3)**

**(Total 7 marks)**