

Test 7

31 January 2019

Maths 10 subject: *systems of simultaneous equations*

Name : _____

Problem 1

Solve the following systems of simultaneous equations :

1) by substitution $\begin{cases} x + 3y = 32 \\ 5x - 7y = 72 \end{cases}$ [5 marks]

2) by combination $\begin{cases} \frac{x}{2} + 5y = -5 \\ x - \frac{3y}{2} = -13 \end{cases}$ [5 marks]

3) by Cramer $\begin{cases} \sqrt{27}x + \sqrt{2}y = 7 \\ \sqrt{8}x + \sqrt{3}y = \sqrt{6} \end{cases}$ [5 marks]

4) by the method you want $\begin{cases} \pi x - 3y = -8 \\ -2x + y = 2 \end{cases}$ [5 marks]

Problem 2

i) What is a *singular* system ? [2 marks]

ii) Which of the three following systems are *singular*? [3 marks]

A) $\begin{cases} 18x - 12y = 78 \\ -15x + 10y = -65 \end{cases}$ B) $\begin{cases} -3x - 21y = 39 \\ 2x - 14y = 26 \end{cases}$ C) $\begin{cases} 3x - 21y = 19 \\ -2x + 14y = -4 \end{cases}$

ii) State and explain whether the singular systems of (i) have *infinite number of solutions* or *no solutions*. [3 marks]

Problem 3

Solve the following system of *simultaneous equations*, giving x and y in terms of k .

$$\begin{cases} x - ky = 1 \\ -5x + 6y = -2 \end{cases}$$

[8 marks]

Bonus

- i) – Find the value of k (of problem 3) for having the solution $x = 4$.
– Hence what would be the value for y ?

[+2 marks]

- ii) – Find the value of k such that the system (as given in problem 3) is *singular*.
– How many solution(s) would have this singular system ?

[+2 marks]

iii) Simplify : $\left(\frac{4x^2}{3y}\right)^2 \left(\frac{27y^5}{18x^3}\right)$

[+2 marks]