

All questions should be submitted by 2pm on Thursday 10 January. Assignments can be submitted at your tutorial or to the MATH1040 assignment box (3rd floor, Priestley Building). **Make sure that your name, student number and assignment number are on each sheet of your answers.** Write your answers on a separate sheet of paper. You do not need a cover sheet nor do you need to include this question sheet. Solutions will be distributed in class later. **There is bonus question at the end.**

1. Solve the following simultaneous equations:

a) $2x + 3y = 19$ and $3x - 2y = -4$

b) $2x - 4y = 4$ and $-x + 2y = -2$

2. If $f(x) = x - x^2$ and $g(x) = x + 2$

a) Find $f(3)$.

b) Find $g(-4)$.

c) Find $f(g(0))$.

d) Find $f(g(x))$.

e) Find $g(f(x))$.

3. Answer each of the following questions, showing all working:

(1) Find $f(-4)$ where $f(z) = 5z^2 + 6z - 7$.

(2) Solve $-2y(-2y - 3) = 0$.

(3) Solve $-10 - 2y^2 + 12y = 0$.

(4) Solve each of the following equations **without** using the quadratic formula:

i. $4x(-7 - 3x) = 0$

ii. $(-5y + 5)(-6 + 8y) = 0$

iii. $(-9 - 6z)(-2z + 3) = 0$

iv. $(-4x + 4)^1 = 0$

(5) Evaluate $(-4)^0$.

(6) Find the domain of $f(z) = -7(|z|)^2$.

(7) Find the range of $f(x) = 10(\sqrt{x})^2$.

(8) Find the domain of $f(z) = \frac{-7}{|z| - 3}$.

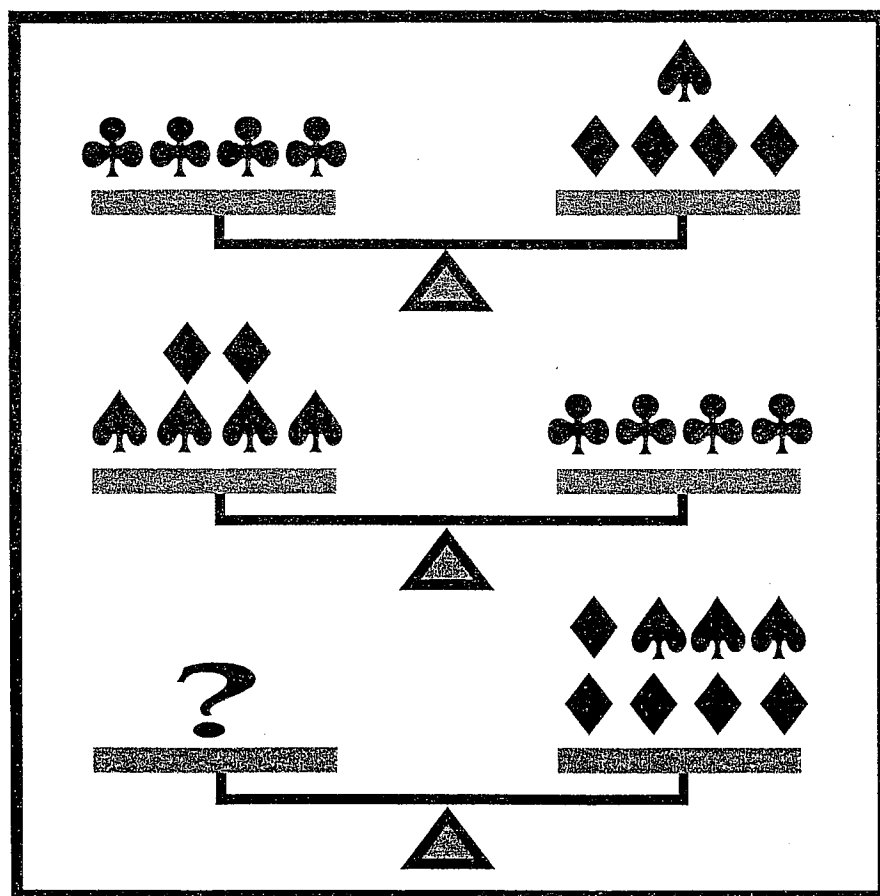
4. At the show, three pony rides and two camel rides cost \$8.50, whereas two pony rides and three camel rides cost \$9. Letting p be the cost of a pony ride and c the cost of a camel ride, write down a pair of simultaneous equations and so find the cost of each ride.

(continued over...)

5. The evil Harry McBarry has tied Luscious Lisa to the railway track. The 9.52am express train is racing towards Lisa along the line $y = 3x - 2$. Lisa's boyfriend, Marvin McMathman, is at the point (2,7), sitting on his moose.
- (a) Marvin must ride in a straight line towards the railway track and cross the track at the point (1,1) in front of that train, forcing it to stop before it strikes Lisa. What is the equation of the straight line marking Marvin's ride?
- (b) Unfortunately Marvin is a twit (Lisa does not love him for his mind, not for his love of moose). He has no sense of direction so needs help from Charlie the wonder dog. Charlie starts at the point (2,5) and travels towards the railway track on a line parallel to Marvin's. At what point will Charlie cross the railway track? (Hint: you'll need the equations for each of the train, Marvin and Charlie.)

BONUS QUESTION (5 marks)

The first two scales below are in perfect balance. How many clubs (on the left-hand side) will be needed to balance the bottom scale? Show all working.



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