Name	Class	Register Number

MATHEMATICS

PART 1

Tuesday   06 May 2008   1 hour

VICTORIA SCHOOL

MID YEAR EXAMINATION
SECONDARY TWO

READ THESE INSTRUCTIONS FIRST

Write your name, class and register number on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use paper clips, highlighters, glue or correction fluid.

Answer ALL the questions.
Omission of essential working will result in loss of marks.
Calculators may NOT be used.

The number of marks is give in brackets [ ] at the end of each question or part question.
The total number of marks for this part is 50.

Part 1 consists of **10** printed pages, including the cover page.

[Turn over

1   Expand $(y+4)(\dfrac{2}{y}-1)$.

Answer   « « « « « « « « « « «   [2]

2   Expand $(x-2y)(x+2y)(x^2+4y^2)$.

Answer   « « « « « « « « « « «   [2]

3   Simplify $\dfrac{3(y-x)}{4xy} \div \dfrac{15x(x-y)^2}{10x^2y^3}$.

Answer   « « « « « « « « « « ☐ [3]

4   Simplify $\dfrac{x+7}{3} + \dfrac{7x-2}{5} - \dfrac{5x-6}{2}$ as a single fraction.

Answer   « « « « « « « « « ☐ [3]

5   Solve $t(6t-5)=4$.

Answer t « « « □ or t « « « ⊞ [3]

6   Solve $\dfrac{3}{x-4} - \dfrac{x-5}{2x^2-5x-12} = \dfrac{4}{2x+3}$.

Answer x « ⊞ « « « « « ⊞ [3]

7   Given that $B = \dfrac{A(1+3y)}{2y-P}$, express y in terms of A, B and P.

Answer   « « « « « « « « « « «   [3]

8   Simplify $\dfrac{2}{x^2+4x+3} + \dfrac{1}{x^2+7x+12}$ as a single fraction.

Answer   « « « « « « « « « « «   [4]

9   Factorise the following completely.

(a) $\frac{1}{4}x^2 + 81 - 9x$

(b) $6pq - 2rs - 3p^2q^2 + pqrs$

Answer **(a)**   « « « « « « « « « «   [2]

(b)   « « « « « « « « « «   [2]

10   Solve $\frac{n-3}{4} = \frac{1}{2} - \frac{1}{n-1}$.

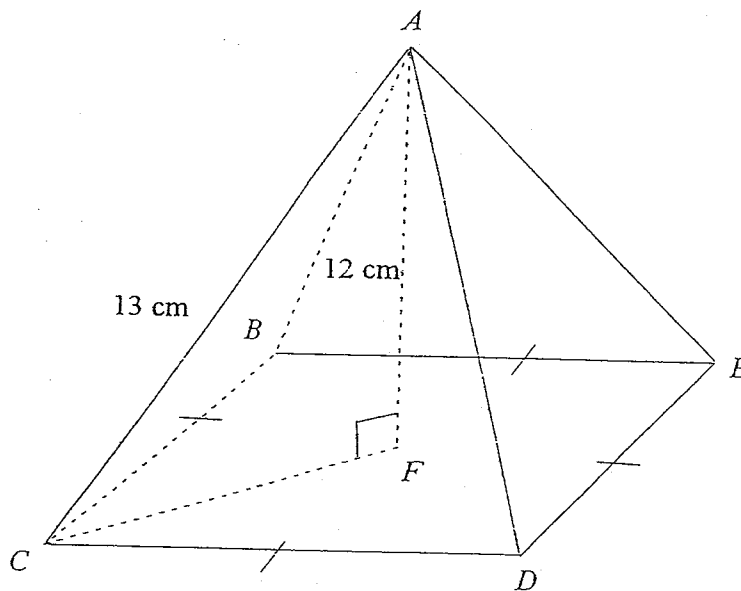*Answer* n « « « « ⯐ « « « «   [4]

11
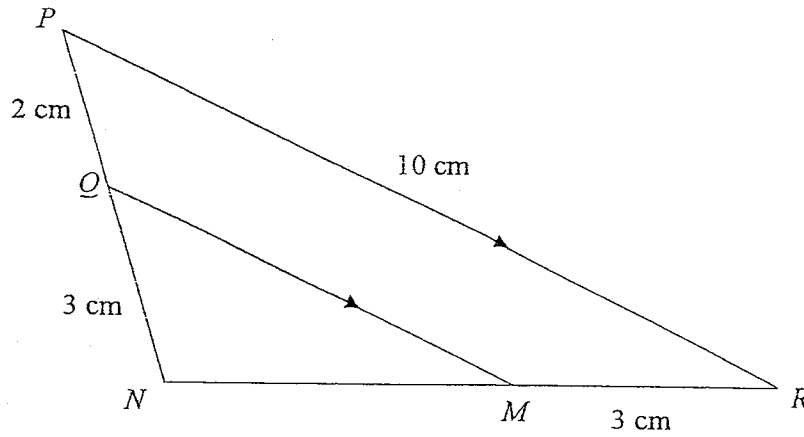
In the diagram, QM is parallel to PR. Given that $MR = 3$ cm, $NQ = 3$ cm, $QP = 2$ cm and $PR = 10$ cm,

(a)   state a pair of similar triangles and show why they are similar,

(b)   find the length of NM.

Answer   **(a)**   △« « « □and △« « ◙ ◫ [2]

                (b) NM « « « « « « « cm   [2]

7

12
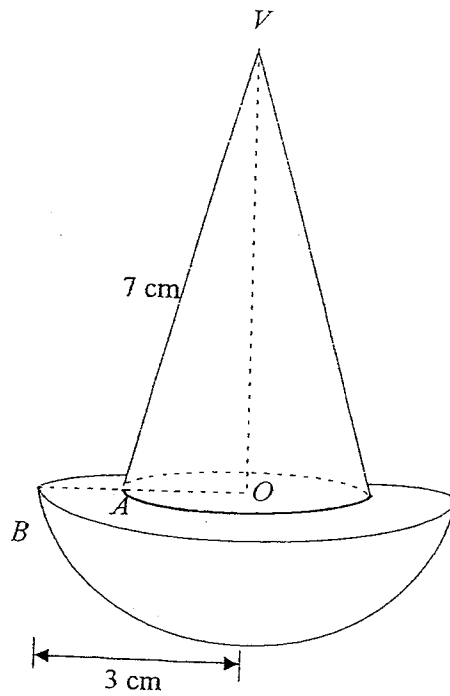

The diagram shows a regular pyramid $ABCDE$ with a square base. Point F is directly below point A. Given that $AF = 12$ cm and $AC = 13$ cm, find the volume of pyramid $ABCDE$.

Answer 《 《 《 《 《 《 ⫿⫿⫿⫿⫿⫿⫿ cm^3 [4]

The figure shows a solid cone, with slanted height VA of 7 cm, attaches to the solid hemisphere with radius OB of 3 cm☐ The tip of the cone V is directly above the centre of the hemisphere☐Given that the curved surface area of the cone is 44 cm^2, find the total surface area of the solid☐

(Take the value of π to be $\dfrac{22}{7}$ ☐)

Answer   « « « « « « « ☐☐☐ cm^2 [5]

14   A map is drawn to a scale of 4: 60 000. Calculate
   (a)   the representative fraction (R.F.) of the map,
   (b)   the length, in cm, of a line on a map which represents a road of distance 0.9km,
   (c)   the area, in km², of the park which is represented by an area of 10 cm² on the map.

Answer **(a)**   « « « « « « « « « « «   [1]

(b)   « « « « « « « « « cm   [2]

(c)   « « « « « « « ☐☐ km²   [3]

End of Part 1

08/2M/EM/2

MATHEMATICS

PART 2

Tuesday   06 May 2008   1 hour 30 minutes

VICTORIA SCHOOL

MID YEAR EXAMINATION
SECONDARY TWO

READ THESE INSTRUCTIONS FIRST

Write your name, class and register number on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use paper clips, highlighters, glue or correction fluid.

Answer **ALL** the questions.
Omission of essential working will result in loss of marks.
You are expected to use a scientific calculator to evaluate explicit numerical expressions.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use your calculator value, unless the question requires the answer in terms of π.

At the end of the examination, fasten all your work securely together.
The number of marks is give in brackets [ ] at the end of each question or part question.
The total number of marks for this part is 50.

Part 1 consists of __3__ printed pages, including the cover page.

[Turn over

1   (a)   If $x^2 + y^2 = 12$ and $xy = 4.25$, find the value of $2(x+y)^2 - 5(x-y)^2$.   [2]

     (b)   Simplify $\dfrac{15x^2}{57y - 9y^2 - 90}$.   [2]

2   (a)   Simplify $\dfrac{x^2 + 7x + 6}{x^2 + 5x + 4}$.   [3]

     (b)   Hence, or otherwise, simplify $\dfrac{(y+2)^2 + 7y + 20}{(y+2)^2 + 5y + 14}$.   [3]

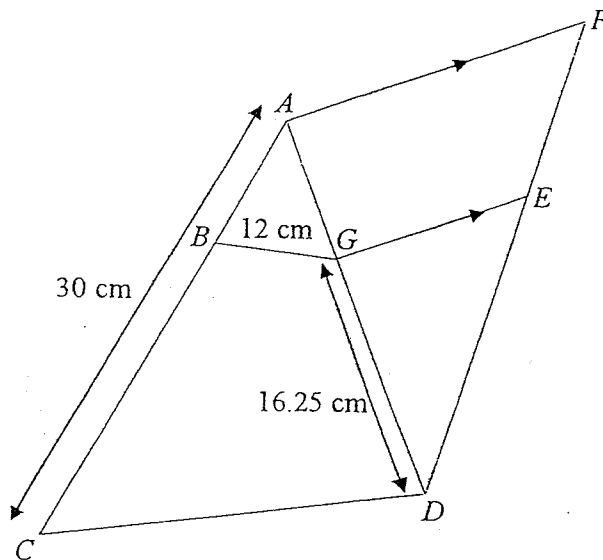3   A pond, which is 20.25 km², is represented by 4 cm² on a map.

     (a)   The area of a garden is 9.72 km². Calculate the area, in cm², on the map which represents the garden.   [2]

     (b)   Find the actual distance of a road, in km, which is represented by 6.8 cm on the map.   [3]

4   Make h the subject of the equation

$$v = 4\sqrt{\dfrac{g^2 - h^2}{3g^2 + 2h^2}}.$$ [5]

5

In the diagram above, $\triangle AGB$ is similar to $\triangle ACD$ and GE is parallel to AF. Given that the ratio of $DE : DF = 5 : 8$, $GD = 16.25$ cm, $AC = 30$ cm and $BG = 12$ cm, find the length of CD.   [5]

6   Solve (a) $\left(x^3 - 16x^5\right)^2 = 0$.

[4]

(b) $\dfrac{x}{x+1} - \dfrac{5}{x-1} = \dfrac{3-4x}{x^2-1}$, $x \neq 1$ or -1

[4]

7   Ms Tan, a fruit seller, bought x pears for \$48 and sold them at a profit of 20 cents per pear.
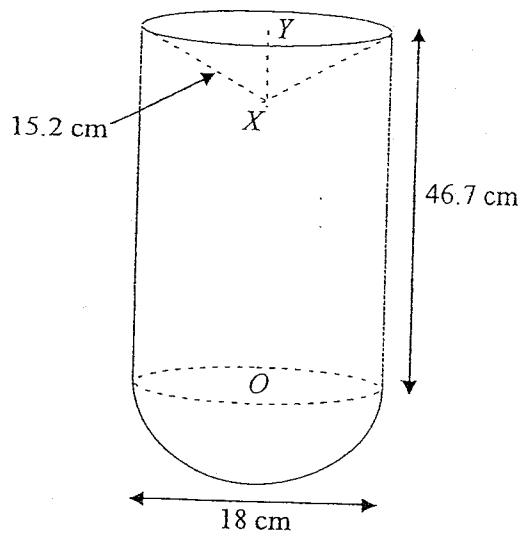
(a)   Write down, in terms of x, an expression for
  (i)   the cost price of 1 pear in cents;
  (ii)   the selling price of 1 pear in cents.

[2]

When she had sold all except 30 of her pears, she found that she had received \$54.

(b)   Form an equation involving x and show that it reduces to
  $x^2 - 60x - 7200 = 0$.

[3]

(c)   Solve this equation to find the number of pears that Ms Tan bought.

[3]

8

The above figure shows a solid comprising of a hemisphere of diameter 18 cm with centre O and a cylinder of height 46.7 cm. A right cone with centre Y is removed from the top of the solid. Given that the slanted height of the cone is 15.2 cm, find

(a)   the total surface area of the solid,

[4]

(b)   the volume of the solid.

[5]

End of Part 2