

COMMONWEALTH OF AUSTRALIA

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Family Name	
Given Names	
Student Number	
Teaching Period	Semester 2 Special/Summer Semester, 2015

FINAL EXAMINATION	DURATION				
TEP023 – Foundation Maths	<table border="1"> <tr> <td>Reading Time:</td> <td>10 minutes</td> </tr> <tr> <td>Writing Time:</td> <td>180 minutes</td> </tr> </table>	Reading Time:	10 minutes	Writing Time:	180 minutes
Reading Time:	10 minutes				
Writing Time:	180 minutes				

INSTRUCTIONS TO CANDIDATES

- 1.1 Please ensure that your full name and student number are clearly written in the top right hand corner of this question paper.
- 1.2 All questions must be answered directly on this question paper in the spaces provided.
- 1.3 Note that questions are not of equal value. Marks are indicated at the end of each question. The total number of marks for the paper is 100 marks.
- 1.4 Read all questions carefully. Attempt all questions and show full working for each question.
- 1.5 Circle your lecturer’s name: Megan Theodore, Suzie Jokic, Narges Rezvani Majid.
- 1.6 You may begin writing only when instructed to do so.

EXAM CONDITIONS

You may begin writing from the commencement of the examination session. The reading time indicated above is provided as a guide only.

This is a RESTRICTED OPEN BOOK examination

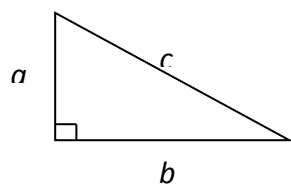
Any non-programmable calculator is permitted

One A4 sheet of handwritten single-sided notes permitted

Any hard copy, unannotated English dictionary is permitted

ADDITIONAL AUTHORISED MATERIALS	EXAMINATION MATERIALS TO BE SUPPLIED
No additional printed material is permitted.	none

Formulae



$$c = \sqrt{a^2 + b^2}$$

Circumference of a circle = $2\pi r$

Area of a circle = πr^2

Area of a triangle = $\frac{1}{2}bh$

Question 1

[8 Marks]

Evaluate the following without a calculator.

a) 25.5×-0.05 (2) | b) $2.20 \div 0.04$ (2)

c) $8 + 42 \div 7 - 1 \times 4$ (2) | d) $\frac{\sqrt{12^2 - 6^2 + 13}}{18 - 13 + 6}$ (2)

Question 2

[6 Marks]

Calculate the following:

a) Express 0.650 as a fraction in simplest form. (2)

b) Express 357% as a decimal. (1)

c) Julie gained a mark of 84 for an assignment worth 120 marks while Adrian had a mark of 65 for an assignment worth 90 marks. Which student did better on their assignment? (3)

Evaluate the following as fraction operations showing full sequential working. Give your answers as mixed numbers or fractions in their simplest form as appropriate.

a) $4\frac{1}{4} - \frac{8}{3}$

(2)

b) $\frac{3}{4} \div 2\frac{1}{2}$

(2)

c) $2\frac{2}{5} - 1\frac{1}{2} \times \frac{3}{4}$

(3)

- d) Emily has seven and a half pizzas to share between 12 people. What fraction of pizza will each person receive? (2)

Question 4

[6 Marks]

Eleanor baked a cake. Eleanor and her mother ate three-fifths of the cake. Eleanor gave the remainder of the cake to their neighbour Joe. Use fraction operations and show full working to calculate answers to the following questions.

- a) What fraction of cake did Eleanor give to Joe? (2)
- b) What fraction of cake did Eleanor eat if she had only one quarter of what she shared with her mother? (2)
- c) What fraction of the cake did Eleanor's mother eat? (2)

Question 5

[4 marks]

Complete the table given below.

Ordinary Number	Scientific Notation
0.000045	
	1.65×10^3
869000	
	3.7×10^{-7}

- a) Michael bought a home for \$485000 last year. If the value of the home increased 10% over the year, determine the value of the home this year. (2)
- b) Albert, Lim and Jenny have bought a campervan for their trip around Australia. If they paid \$27000 for the van and split the cost in the ratio 4:2:3, calculate how much each person paid. (3)
- c) The scale given on a topographic map (a map that shows height contours) is 1:10000. Calculate the distance on the ground if it is represented by 3.45 cm on the map. Give your answer in metres. (2)
- d) Sandu has begun a new landscaping business. He has billed his first customer \$6600 for removal of vegetation and replanting. If the amount billed includes the GST that Sandu owes the government, calculate the amount of GST that Sandu owes and the amount that his business can keep. (3)

Question 7

[5 Marks]

Evaluate the following by substituting the values given for the variable.

a) $12 - 5x$ $(x = -4)$ (2)

b) $\frac{3(a - b)}{b + a^2}$ $(a = -2 \text{ and } b = 5)$ (3)

Question 8

[6 Marks]

Simplify the following algebraic expressions.

a) $9x - 7x^2 - 7x + 8x^2$ (2)

b) $-12a^2b \div -6ab^2$ (2)

c) $\frac{2p^2q \times -5pq^2}{q^3}$ (2)

Expand and simplify the following algebraic expressions.

a) $4x(x + y) - 3xy$ (2)

b) $a(2a + 4b) - 2a(a - 2b)$ (2)

Factorise the following algebraic expressions.

a) $20x - 8y$ (2)

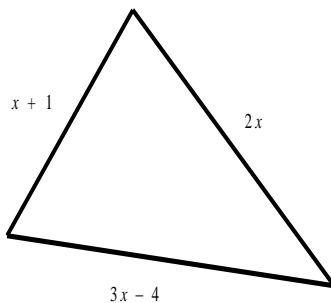
b) $2ab - 8a^2b$ (3)

Solve for the unknown pronumeral. Show logical and sequential working.

a) $\frac{2a + 11}{3} = 1$ (2)

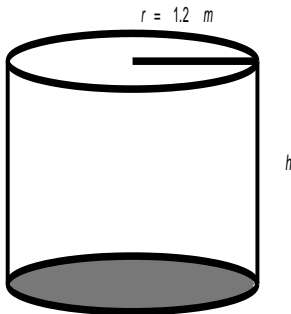
b) $3(x - 3) = 5x + 2$ (2)

- c) The perimeter, P , of the triangle shown below is 24 cm. Write an expression for P (4)
in terms of x . Calculate x and hence determine the length of the three individual
sides of the triangle.



The formula for finding the area of the curved surface of a water tank is given by $A = 2\pi r h$, where A is the area of the curved surface, $r = 1.2\text{m}$ is the radius of the tank and h the height is unknown.

a)



(2)

Use the formula given above to make h the subject of the formula.

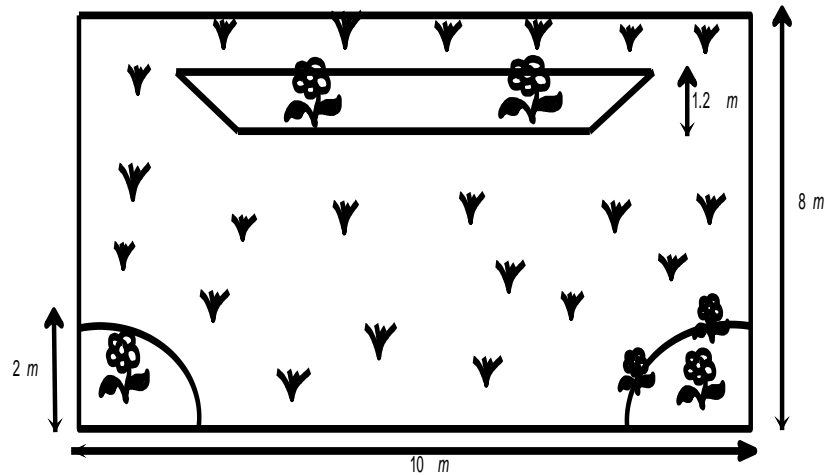
b) If the area of the curved surface of the tank is 20 m^2 , use your formula from part a) above to calculate the height of the tank, (correct to 2 decimal places after the decimal point.) (2)

c) The curved surface of the water tank needs to be painted and two coats of paint will be necessary. A one litre can of paint gives coverage of 16 m^2 per litre. How many tins of paint will need to be purchased? (2)

Question 12 continued next page

- d) The circular top of the tank also needs to be painted. Is there enough paint left over to cover the top of the tank with one coat of paint? (3)
- e) The vertical distance from the bottom of the tank to the base of the overflow pipe near the top of the tank is 2.5 m. Calculate the capacity of the tank when completely full. (Give your answer correct to two decimal places). (Remember the general formula for volume is the area of the base times the height). (2)
- f) The tank has a leak in the bottom and water drains out of it at a rate of 35 litres per hour. How long will it take for all the water to drain out of the tank? Round your answer to whole days. (3)

At a local wedding venue a garden area of rectangular shape and of dimensions 8m x 10m is to be altered to include 3 flower beds, two of quarter circle shape and one trapezium. The radius of the quarter circles is 2m and the height of the trapezium is 1.2 m. The remainder of the garden area is lawn.



- a) The long side of the trapezium is 7 m and the short side is 5.5 m. Add this information to the diagram above. (1)
- b) Liquid fertilizer is to be added to the entire garden area. The directions on the bottle state that 20ml of liquid fertilizer needs to be added to 10 litres of water before the solutions can be administered to the soil. Determine the ratio of liquid fertilizer to water as given in the directions. (2)
- c) If 2000 litres of fertilizer and water solution is added to the entire garden area, calculate the concentration of the solution per m^2 over the entire garden area. (1)

Question 13 continued next page

- d) The formula for area of a trapezium is given by (3)

$$A = \frac{(a + b)h}{2}$$

where a and b are the lengths of the parallel sides and h is the height.
Use this information to calculate the total area of all the flower beds in the garden.

- e) Determine the percentage of the lawn relative to the entire garden area. (2)

- f) The entire garden area (flower beds and lawn) will need soil fill to a depth of 15cm. Calculate the volume of soil to be delivered.

- (i) Give your answer in m^3 . (2)

- (ii) Give your answer in cm^3 and scientific notation (2)

- (g) Each cubic metre of soil delivered will cost \$105 per m^3 and \$120 for delivery. (2)
Calculate the total cost to have the required volume of soil delivered.

	END OF EXAMINATION	
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