

COMMONWEALTH OF AUSTRALIA

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|-----------------|------------------|
| Family Name | |
| Given Names | |
| Student Number | |
| Teaching Period | Semester 1, 2016 |

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|----------------------------------|--|---------------|-------------------|---------------|--------------------|
| 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 |
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| Writing Time: | 180 minutes | | | | |

INSTRUCTIONS TO CANDIDATES

- Write your full name and student number in the top right hand corner of this question paper.
- Circle your lecturer/tutor’s name:
Susi Bertei, Helena Trevena, Anjilin Lata, Suzie Jokic, Narges Rezvani Majid
- All questions must be answered directly on this question paper in the spaces provided.**
- Read all questions carefully. Attempt all questions and show full working for each question.
- Note that questions are not of equal value. Marks are indicated at the end of each question. The total number of marks for this paper is 92 marks.

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

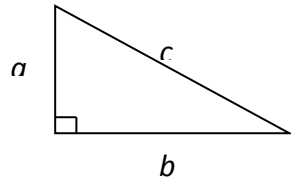
Any calculator is permitted

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. | Two pieces of scrap paper is to be provided. |

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) -12.5×0.45

(2)

b) $4.254 \div 0.3$

(2)

c) $7 \times (6 \times 6 + 14) \div 5 - 6$

(2)

d) $9^2 \div 3 + \frac{\sqrt{49} - 15}{2^3}$ (2)

Question 2

[5 Marks]

- a) Express 176% as a decimal. (1)
- b) Express $2\frac{1}{3}$ as a percentage correct to 1 decimal place. (1)
- c) Express 0.14 as a fraction in simplest form. (1)
- d) Matt and Simon entered two different Powerball syndicate draws. Both syndicates won the same total amount of money. In his syndicate, Matt received $\frac{16}{21}$ of the winnings, whilst Simon received $\frac{43}{54}$ of the winnings in his syndicate. Who won the most money? Show working to justify your answer. (2)

Question 3

[9 Marks]

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) $1\frac{2}{3} - 2\frac{1}{2}$

(2)

b) $1\frac{1}{3} \times 4\frac{2}{7}$

(2)

c) $\frac{15}{4} + \frac{3}{7} \div \frac{3}{14}$

(3)

Question 3 continued over

Question 3 continued

- d) A small company is dividing up its shares: two-fifths of its shares are being sold to the public; the remaining shares are being divided evenly amongst the six company directors. What fraction of the shares does each of the investors get? (2)

Question 4

[4 marks]

Complete the table given below.

| Ordinary Number | Scientific Notation |
|-----------------|-----------------------|
| 72305 | |
| | 1.86×10^{-6} |
| 0.00377 | |
| | 6.86931×10^7 |

Question 5

[5 Marks]

A marathon swimmer swims $\frac{3}{7}$ of the race distance in the first hour and $\frac{2}{5}$ in the second hour. Use fraction operations and show full working to calculate answers to the following questions.

- a) Was the swimmer faster or slower in the second hour compared to the first hour? (2)
Show working to justify your answer.
- b) What fraction of the race distance has the swimmer left to swim? (2)
- c) If the marathon is 14km in total, what distance did the swimmer cover in the first hour? (1)

Question 6

[9 Marks]

- a) During a mid-year sale, a toy store offered 25% discount on all toys in the shop. (2)
What would be the discount obtained on a toy with a marked price of \$23.80 and how much would you pay for the toy during the sale?
- b) To mix standard concrete, gravel, sand and cement are combined in the ratio (3)
5 : 3 : 1. If 18 tonnes of concrete are required for a shed foundation, how much gravel, sand and cement needs to be purchased?
- c) If the exchange rate between the Australian dollar (AUD) and the Great Britain (2)
pound (GBP) currency is \$1 AUD buys £0.48 GBP, calculate how much a purchase on the British Book Depository website for £7.99 GBP will cost in Australian dollars.

Question 6 continued over

Question 6 continued

- d) Steve paid \$568 for a new iPad. The price included the 10% GST. What was the cost of the iPad without GST and how much GST did Steve pay? (2)

Question 7

[5 Marks]

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

a) $2x - y$ ($x = 3$ and $y = -2$) (2)

b) $\frac{2(ab - 4b)}{a^2}$ ($a = -3$ and $b = 4$) (3)

Question 8

[6 Marks]

Simplify the following algebraic expressions.

a) $3dw + 2d^2w - dw - 4wd^2 + 1$ (2)

b) $-15a^4h \div -5a$ (2)

c) $\frac{3x^2 \times 2y^2x}{-24yz}$ (2)

Question 9

[4 Marks]

Expand and simplify the following algebraic expressions.

a) $10y + 6y(6 + 2y)$ (2)

b) $3(3p + 4) - 4p(2pq - 2)$ (2)

Question 10

[5 Marks]

Factorise the following algebraic expressions.

a) $10k - 25$ (2)

b) $16c^2e + 20ce - 8ce^3f$ (3)

Question 11

[10 Marks]

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

a) $22 = 8x - 3$ (2)

b) $\frac{x}{7} + 9 = 4$ (2)

c) $\frac{4x + 6}{7} = 0$ (2)

Question 11 continued over

Question 11 continued

d) $14 - 3x = 5 - 2x$ (2)

e) $-8(5 - 3x) = 2(x + 11)$ (2)

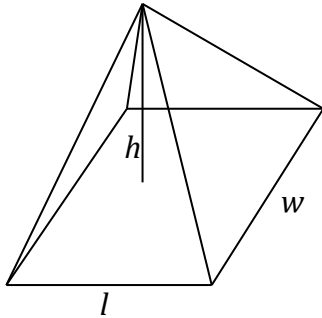
Question 12

[6 Marks]

The volume of a rectangular based pyramid can be calculated using the formula $V = \frac{1}{3}lwh$ where l is the length of the base of the pyramid, w is the width of the base and h is the height of the pyramid.

a)

(2)



Transpose (change) the formula given above to make h the subject.

b) Determine what height the pyramid would need to be if it was to have a volume of 1000cm^3 and has a length of 50cm and width of 30cm . (2)

c) If the height of the pyramid was increased to 5.6cm , but the length and width stayed the same, how many litres of water could the pyramid hold? (2)

(Note: $1 \text{ litre} = 1000 \text{ cm}^3$)

Question 13

[5 Marks]

- a) The medication order for a patient is 400 ml of a drug over a 3 hour period. Given a drop rate of 15 drops/ml, what is the drop rate in drops/min? Give your answer correct to 2 decimal places. (2)

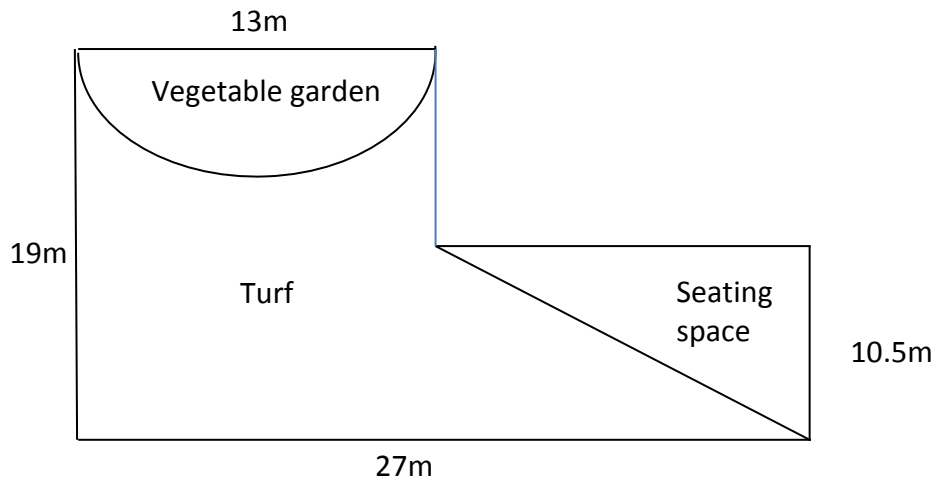
- b) In 2013, Zimbabwe had a population of approximately 14 150 000 people and approximately 280 000 births. In the same year, Thailand had a population of approximately 67 010 000 people and 1 022 000 births. The birth rate of a country is given as the number of births per 1000 head of population. (3)

Which country had the greater birth rate? Show full working to justify your answer.

Question 14

[11 Marks]

A playground for a primary school is being redeveloped. The proposed plans for the playground consist of a semi-circular vegetable garden, a triangular paved seating space and the remaining area to be covered in turf, as shown on the diagram below.



- a) Calculate the area of the seating space. (2)
- b) Garden edging is to be purchased for the curved length of the vegetable garden. (3)
It is available in 5m length rolls at a cost of \$11.98 per roll. How much will the garden edging cost in total?

Question 14 continued over

Question 14 continued

- c) A fundraising cake stall raised \$2000 to purchase soil for the vegetable garden. (3)
Soil costs \$62.50 per m^3 . Calculate how many m^3 of soil the cake stall money will buy and the depth of soil to which it can be laid.

- d) The school council has raised a concern about the large area of turf and the (3)
quantity of water that will be required to maintain it. Recommendations
indicate that the area of turf in a playground should be no greater than 55% of
the total playground area.

Do the proposed plans meet these requirements? Show all working to justify your answer.

END OF EXAMINATION