



Full name:.....

Teacher:.....

Due date:.....

Orange High School

Year 11 Standard Mathematics

Task 2 Assignment 2021

PART ONE (Take Home)

Outcomes Assessed

MS11-3: solves problems involving quantity measurement, including accuracy and the choice of relevant units

MS11-4: performs calculations in relation to two-dimensional and three-dimensional figures

MS11-5: models relevant financial situations using appropriate tools

MS11-7 develops and carries out simple statistical processes to answer questions posed

MS11-10: justifies a response to a given problem using appropriate mathematical terminology and/or calculations

Weighting task 2 30%

Due: This assignment is due to your classroom teacher in class, **Friday 18th June, 2021(term two week nine).**

Penalties as per assessment booklet

Failure to submit the assignment within the negotiated timeframe may result in an N-award in Standard Mathematics.

Total Marks /65

Year 11 Standard Mathematics Assignment

Nature of the task

Part One

This assignment requires students to apply what they have learnt in class to a real world context. In Section 1, students will need to research the income for a job of their choosing and then answer questions about income and taxation for that job. In Section 2 and Section 3, students will be required to show all the steps in solving the problems.

Part One is worth 40% of the Task Two marks.

Part Two

There will be a one period in class component. Questions may be similar but not limited to those questions.

Part two is worth 60% of Task Two marks.

Hand-in components of this task with the in-class component of this assignment.

Students will be required to complete the questions in two weeks. They will need to hand in Part One with the Part Two on the day of the test.

Marking criteria

You will be assessed on how well you:

- Accurately solve a variety of problems based on the scenarios.
- Select and use the appropriate mathematical processes, technologies and language to investigate questions from the Financial Mathematics and Measurement Units.
- Provide reasoning and justification related to the problems.

Section 1 – Earning and Managing Money (18 marks)

For this section of the assignment you will need to research a job of your choosing and then answer questions about income and taxes for that job.

Your job and calculations are not to be the same as any other student's assignment.

1. Choose a realistic job for people aged between 16 and 25 that earns over \$19000 p.a. This could be full time employment, working from home or flexible working hours. **1**

Write the job title and give a reason why you have chosen this job.

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2. Research the amount this job will pay annually. Write the advertised wage or award wage or salary for this type of job. Paste in evidence for your answer above. e.g. newspaper clipping or website screenshot. **1**

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3. Using your answer to part 2, calculate:
a. Your gross weekly pay **1**

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- b. Your gross fortnightly pay **1**

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- c. Your gross monthly pay **1**

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4. You are paid a 17.5% leave loading on four weeks of normal pay. Calculate your total leave loading. **2**

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5. PAYG

Use the “Tax withheld for individuals’ calculator” on the Australian Tax Office website to determine your PAYG. Leave the other columns blank.

Print out a screenshot of the result of the calculator (or the tax tables) and attach it to your assignment.

- a. How much tax will be taken out of your fortnightly pay for PAYG instalments? **1**

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- b. Calculate your fortnightly *net* pay. **1**

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- c. How much money will you have paid in PAYG instalments for the financial year? **1**

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6. Allowable deductions

Find the allowable deductions part of the ATO website that relates to your job (from question 2)

- a. List at least four deductions you may claim and the amount you can claim for each deduction. **2**

Allowable Deductions	Amount you will claim per year

Question 6 continues on the next page.....

- b. Using your salary from part 2 and the deductions listed above, calculate your annual taxable income. 1

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7. Tax and Medicare levy.

Taxable income	Tax payable
0 – \$18 200	Nil
\$18 201 – \$37 000	Nil + 19 cents for each \$1 over \$18 200
\$37 001 – \$87 000	\$3572 + 32.5 cents for each \$1 over \$37 000
\$87 001 – \$180 000	\$19 822 + 37 cents for each \$1 over \$87 000
\$180 001 and over	\$54 232 + 45 cents for each \$1 over \$180 000

- a. Find your tax payable for a financial year. 2

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- b. Calculate your Medicare Levy for the financial year. 1

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8. Tax payable or refund 2
Will you receive a tax refund or will you end up with a tax bill? Justify your answer, referring to the appropriate calculations you have made in Questions 6 and 7.

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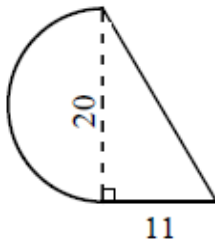
Total: /18

Section 2 – Measurement (30 marks)

1. Calculate the area of the following composite shapes, rounded to two decimal places:

a)

(2 marks)

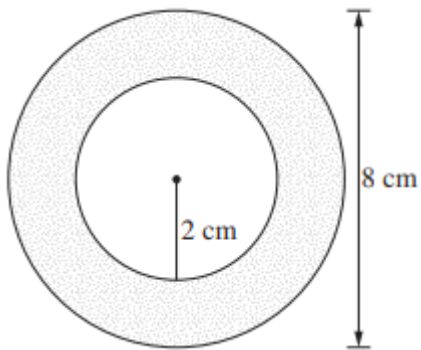


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b)

(2 marks)



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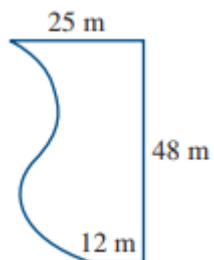
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c) Use The Trapezoidal Rule to estimate the given area.

(2 marks)



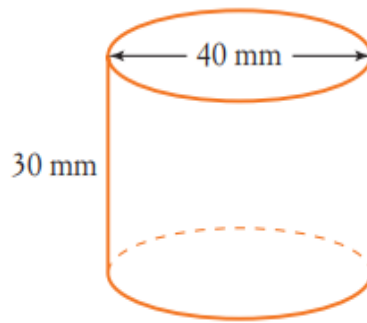
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2. Calculate the surface area of the given solids to the nearest whole square cm.

a)

(2 marks)



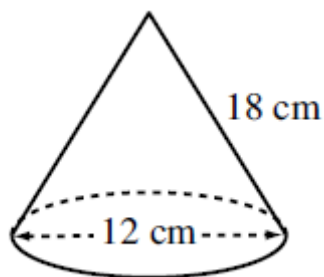
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b)

(2 marks)



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3. Ben measures the length of the tennis table to be 145 cm, to the nearest centimeter.

a) Calculate the limit of reading?

(1 mark)

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b) What is Ben's absolute error for his measurement?

(1 mark)

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- c) What is the percentage error for Ben's measurement? Answer to nearest two decimal places. **(1 mark)**

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4. Write these numbers correct to the number of significant figures indicated. **(3 marks)**
- a) 0.045 (2 significant figures)
 - b) 29100 (1 significant figure)
 - c) 777 777 (3 significant figures)

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5. Cassie is a boxer and skips to keep fit. The table below shows the average energy used, in kilojoules per kilogram of body mass, by a person skipping for 10 minutes at different speeds.

Skipping speed	Energy used in ten minutes
90 per minute	18.20 kJ/kg
120 per minute	24.50 kJ/kg

Cassie eats a cheeseburger that contains 650 kilocalories. If Cassie weighs 75 kilograms, how long must he skip at 120 skips per minute to burn off the energy contained in the cheeseburger? (1 kilocalorie = 4.184 kJ) Give your answer to 1 decimal place. **(2 marks)**

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6. Zoya runs a hot yoga studio. If it costs 36 cents for 1-kilowatt (1000 watts) for 1 hour, how much does it cost her to run five 3400-watt heaters from 9:00 am to 05:30 pm on a single day? (Give your answer to the nearest cent) **(2 marks)**

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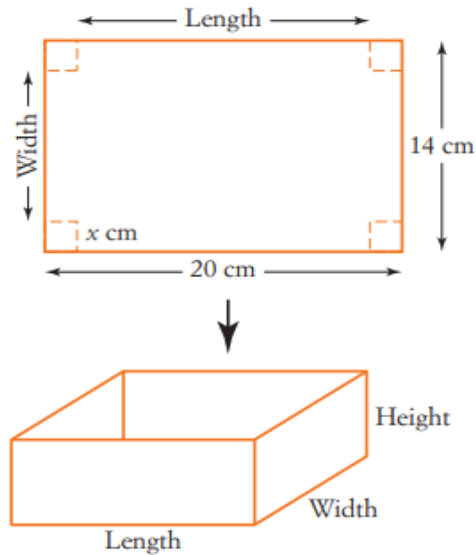
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7. Biggest Volume:

Samantha uses a $20\text{ cm} \times 14\text{ cm}$ sheet of metal to make an open rectangular tray. She needs to cut square corners from the sheet so that it can be folded and welded into shape. What size, with side length of $x\text{ cm}$, must Samantha cut each square if the tray is to have the largest possible volume?



a. Suppose each square has length 2 cm.

1/2 mark each

- i. What is the length of the tray? _____
- ii. What is the width of the tray? _____
- iii. What is the height of the tray? _____
- iv. Show that the volume of the tray is 320m^3

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b. Suppose each square has length $x\text{ cm}$. Write an algebraic expression for:

- i. the length of the tray _____
- ii. the width of the tray _____
- iii. the height of the tray. _____

1 mark each

c. Explain why the length of each square cannot be 7 cm or more.

1 mark

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- d. By guessing-and-checking find, correct to the nearest whole centimetre, the length, x cm, of the square that will give the tray with the biggest volume. Use the table below to help you. **(3 marks)**

Square length (x cm)	Length (of tray)	Width	Height	Volume

- i. Best square length = **(half mark each)**
- ii. The biggest volume =

End of Section 2

Total: / 30

Section 3 – Exploring and Describing Data (17 marks)

1) Mia surveyed ten households in his street. She asked them how many kilolitres of water they used last year. Here are the results

220 105 101 180 450 37 338 151 205 200

a) Calculate the mean of the given set of data. (1 mark)

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b) What is the Standard Deviation, correct to one decimal place. (1 mark)

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2) Write down a set of five numbers which has the following: (2 marks)

mean of 5, median of 4 and mode of 8

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3) This data contains eight house prices in Darwin.

\$324000 \$289000 \$500000 \$350000 \$431000 \$295000 \$385000 \$1900000

a) Show your calculations to prove that \$19 00 000 is an outlier. (3 marks)

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.....(Question 3 continues on the next page)

b) If the outlier was removed from the data set, by how much would the median change? (First work out the median for each case.) **(1 mark)**

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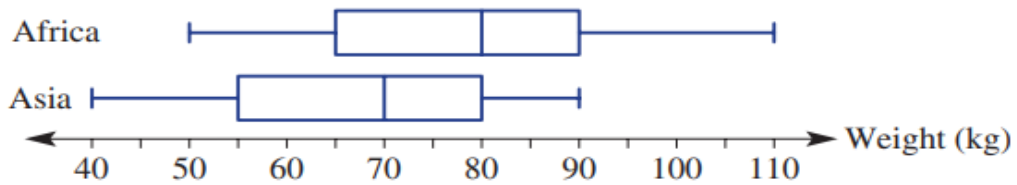
c) If the outlier was removed from the data set, by how much would the mean change, to the nearest dollar? (First work out the mean for each case.) **(2 marks)**

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4) The weights of two samples of adult leopards from Africa and Asia are summarised in these box plots.



a) Which leopard population sample has the highest minimum weight? **(1 mark)**

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b) What is the difference between the ranges for both population samples? **(1 mark)**

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c) Is the IQR the same for both leopard samples? If so, what is it? **(2 marks)**

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- d) What percentage of leopards have a weight less than 80 kg for:
i African leopards?
ii Asian leopards?

(2 marks)

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- e) A leopard has a weight of 90 kg. Is it likely to be an Asian or African leopard?

(1 mark)

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Total: /17

END OF QUESTIONS!