

S1 End-of-Year Review Test (2h)

1. (a) Express 0.015 as a fraction in its lowest term.

(b) Express $1\frac{3}{11}$ as a recurring decimal.

2. (a) Evaluate $-28 \div \sqrt[3]{64} - |12 - (-5 + 10) \times 3 + 20|$.

(b) Express as a fraction in its simplest form.

$$\frac{x-2}{2} - \frac{2x-1}{5}$$

3. The length of a rectangle is twice its breadth. The breadth of the rectangle is $\frac{3}{8}x$ cm.

(a) Express the perimeter of the rectangle in terms of x .

(b) Given that the perimeter of the rectangle is 225 cm, find the area of rectangle.

4. Solve the following equations.

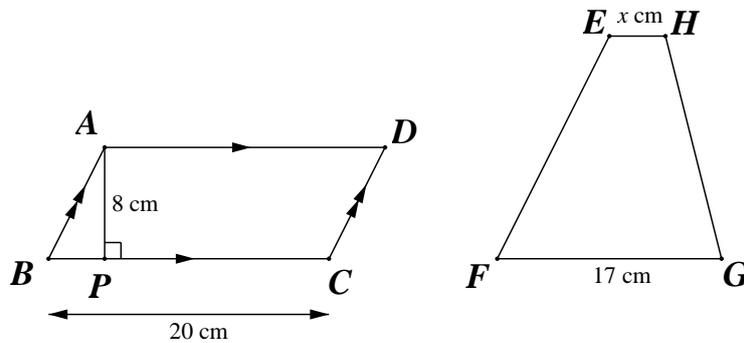
(a) $8x - 5(x - 2) = 4(3x - 2)$

(b) $\frac{3}{10-4x} + \frac{x+1}{2x-5} = 4$

5. (a) Given the $a = -6, b = 8$ and $c = 1\frac{1}{3}$, evaluate $\frac{a^3 + 7b^2}{3b - ac}$.
- (b) Solve the equation $\frac{2x-1}{3} - \frac{3(x-2)}{4} = \frac{x+1}{8}$.
- (c) Factorise completely $8h^2(11k - 5g) - (6 + 5h^2)(5g - 11k)$.
6. Find two consecutive even integers such that the sum of half the smaller number and thrice the greater number is 62.
7. (a) Express 1728 and 2704 separately as products of their prime factors.
- (b) Hence, express $\frac{\sqrt[3]{1728}}{\sqrt{2704}}$ as a fraction in its lowest term.

8. Construct a quadrilateral $ABCD$ such that the base $AB = 9$ cm and $\angle BAD = 85^\circ$. $AD = 7$ cm, $\angle ABC = 75^\circ$ and $CD = 6.8$ cm. Measure and write down the length of BC .

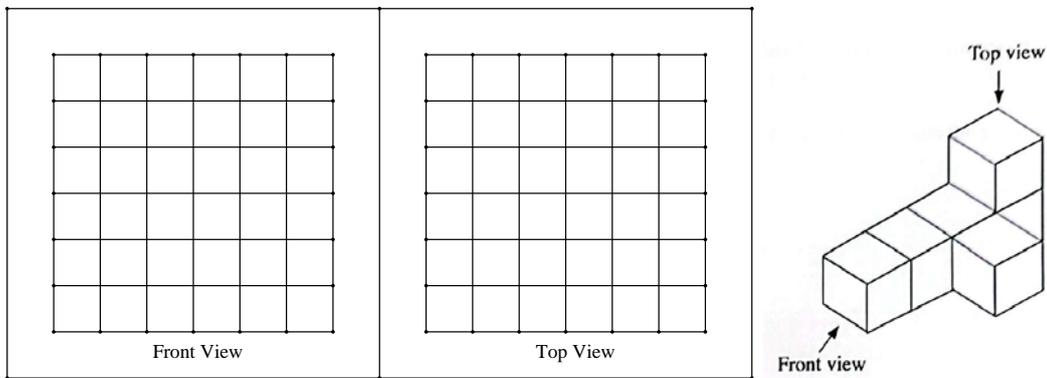
9. (a) Calculate the area of the parallelogram $ABCD$
 (b) Trapezium $EFGH$ and parallelogram $ABCD$ have the same area. Given that the height of the parallelogram is half the height of the trapezium, calculate the value of x .



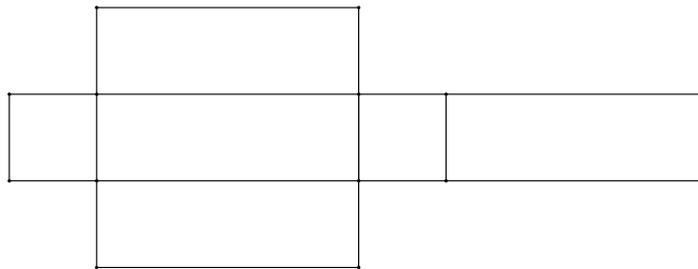
10. Jack left Town A at 06 55 and drove to Town B which was 70 km away. After travelling for 45 km at an average speed of 60 km/h, he stopped for a rest. 1 hour and 15 minutes later he continued his journey at an average speed of 50 km/h. Calculate
 (a) the time he reached Town B ,
 (b) his average speed for the whole journey.

11. A premium coffee powder costing \$20 per kg is made up of a mixture of 8 kg of Grade A coffee powder, 6 kg of Grade B coffee powder and 10 kg of Grade C coffee powder. Grade A coffee powder costs twice as much as Grade B coffee powder. Grade C coffee powder costs \$8 more than Grade B coffee powder. Find the cost of 1 kg of Grade B coffee powder.

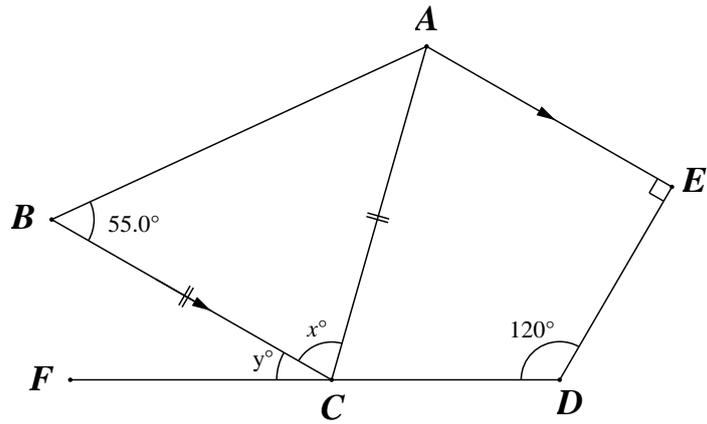
12. The solid below is made up of identical cubes.
 (a) Draw the front view and the top view of the solid.



- (b) Draw a sketch of the solid that can be formed by the net shown below.



13. Calculate the values of x° and y° .



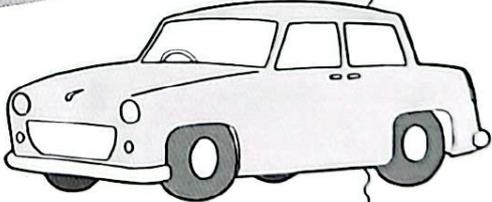
14. (a) Calculate the size of each interior angle of a regular 12-gon.
 (b) A regular polygon has n sides. The size of each interior angle is 132 more than the size of each exterior angle. Find the value of n .

15. Mr Daniels gave \$6000 to his three children, Anne, Tom and Jack in the ratio 3:9:13.
- (a) Anne spent her money on a bicycle, a gold bracelet and a mobile phone in the ratio 3:8:5. How much did the bracelet cost?
- (b) Tom spent $\frac{1}{4}$ of his money on a camera. He bought the camera at a discount of 20%. Calculate the marked price of the camera.
- (c) Jack spent 80% of his money on an electric guitar. At the end of the first year, the value of the guitar had fallen a further 10%. At the end of the second year, the value of the guitar had fallen by 15% of its value at the end of the first year. Find the value of the guitar at the end of the second year.

16. The cash price of a new car is \$150 000. Mr Tan buys the car under the hire purchase scheme as shown below.

Hire Purchase Scheme

- Deposit of 20% of cash price.
- Simple interest rate of 2% per year over 5 years.
- Repayment to be made monthly.

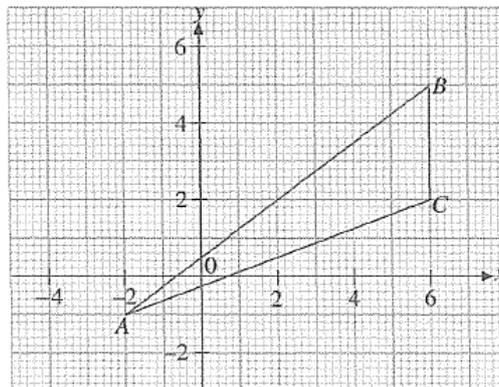


Calculate

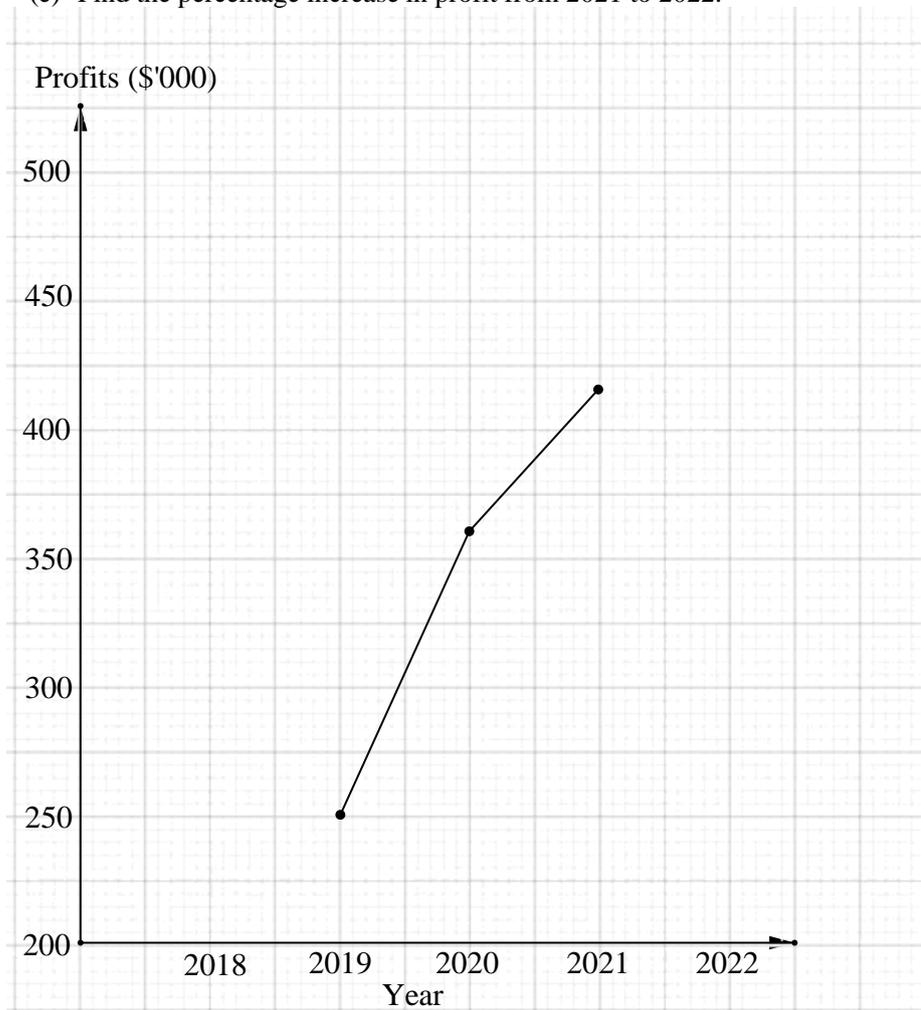
- (a) the total interest charged,
(b) each monthly instalment.

17. During the Singapore Sale, shirts were sold at 20% discount and pants at 25% discount. Marc bought 6 shirts for \$15 each and 5 pairs of pants. The marked price for each pair of pants is \$50.
- Find the marked price of each shirt.
 - Find the selling price of each pair of pants.
 - Find the overall percentage discount.
 - Find the total amount Marc has to pay inclusive of 8% GST, giving your answer correct to the nearest cent.

18. The diagram shows $\triangle ABC$.
- Calculate the gradients of
 - AB ,
 - BC .
 - Find the area of $\triangle ABC$.
 - Write down the equation of the line BC .



19. The line graph shows the profits of a company from 2018 to 2022.
- The profit earned in 2020 was 20% more than the profit earned in 2018. Calculate the profit earned in 2018.
 - The profit earned in 2022 was twice the profit earned in 2019. Calculate the profit earned in 2022.
 - Complete the line graph from 2018 to 2022.
 - Between which years was there a decrease in profits?
 - Find the percentage increase in profit from 2021 to 2022.



20. The diagram shows the molecular structure of alkanes, a class of hydrocarbons. C represents a carbon atom and H, a hydrogen atom. A connecting segment shows a chemical bond. Some of the members of the family are represented in the diagram below.

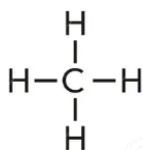


Figure 1
(methane)

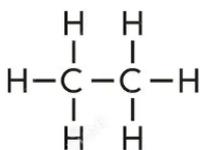


Figure 2
(ethane)

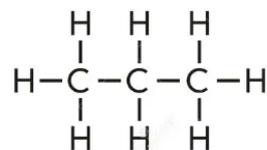


Figure 3
(propane)

- (a) Draw the next pattern in the series.

- (b) Complete the table below.

Figure number	1	2	3	4	5		10		
Number of carbon atoms, C									
Number of hydrogen atoms, H									50

- (c) If n represents the number of carbon atoms and m represents the number of hydrogen atoms, write down an equation connecting m and n .

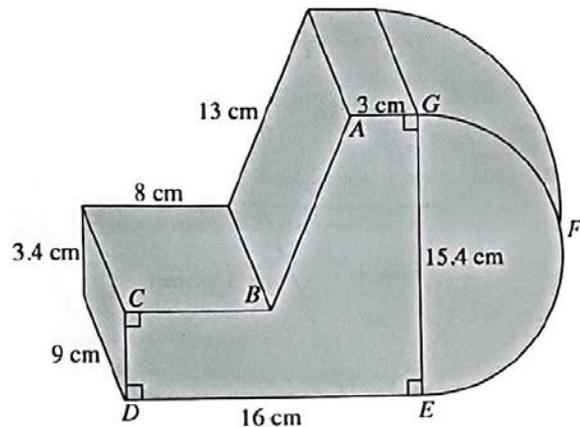
- (d) Hectane is an alkane with 100 carbon atoms. How many hydrogen atoms does it have?

21. A cylinder with a base diameter of 25.2 cm and height 1 m is $\frac{3}{8}$ filled with water.

- Calculate the volume of water, in cm^3 , in the cylinder.
- Calculate the total internal surface area of the cylinder in contact with water. Give your answer correct to the nearest cm^2 . (Assume that the thickness of the cylinder is negligible.)

$$\left(\text{Take } \pi = \frac{22}{7}. \right)$$

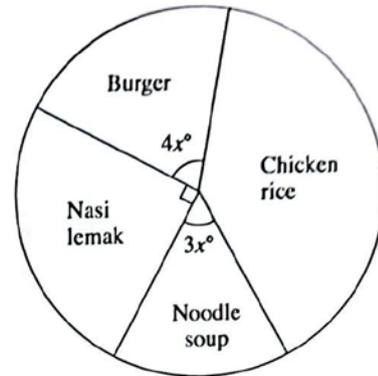
22. The diagram shows a toy block in the shape of a prism. EFG is a semicircle.



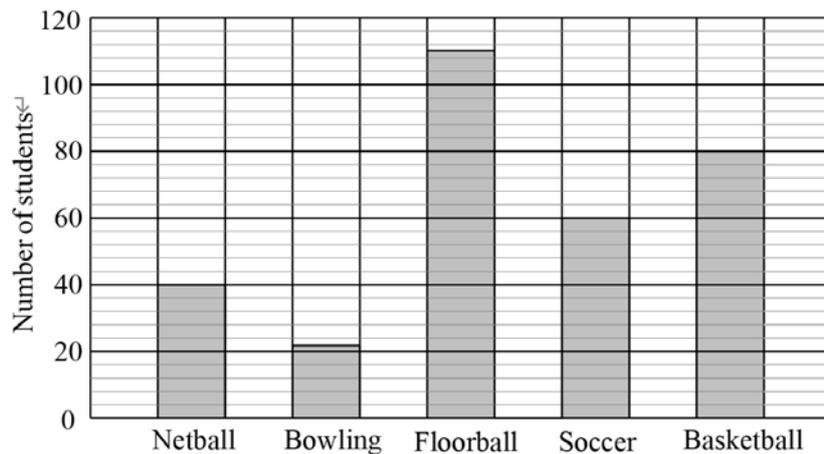
- Calculate the volume of the toy.
- Calculate the total surface area of the toy.
- The exterior surface area of the toy is to be painted. If the cost of paint is \$62.40 per m^2 find correct to the nearest cent, the total cost of painting 500 such toys.

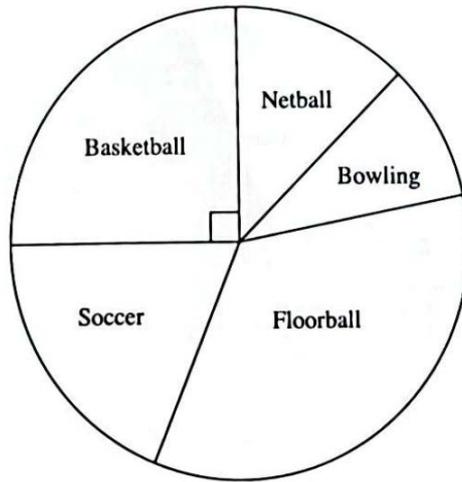
$$\left(\text{Take } \pi = \frac{22}{7}. \right)$$

23. A teacher conducted a survey to find out what each of the 320 Secondary One students had for lunch. The results are shown in the pie chart.
- If 128 students had chicken rice, calculate the value of x° .
 - Calculate the fraction of students who had noodle soup.
 - The canteen offers fish and chicken burgers. 75% of the students who had burgers were boys and 25% of the girls had fish burgers. What percentage of the students who had burgers were girls who had chicken burgers?



24. (a) A survey was conducted to find the choice of the favourite sports of a group of Secondary 1 students. The results are represented in the bar graph and pie chart shown below. Which of the statistical diagrams show the proportion of students who like basketball more clearly? Explain your answer.





- (b) Another survey was conducted by Samuel and Keith, on the number of hours the Secondary I students spent on homework daily.
- (i) Samuel carried out his survey by asking students he saw coming out of a remedial class. Is this a good way to obtain his data? Give a reason for your answer.
- (ii) This was part of Keith's survey.

How long do you spend on homework daily? Tick (✓) your answer.			
1h	2h	3h	4h
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Give two reasons why his data might be unreliable.

- (c) The table below shows the results of the data collected from Keith's survey.

Time (hours)	1	2	3	4
Number of students	13	19	26	32

- (i) Find the percentage of students who spend 2 hours or more on homework per day.
- (ii) If the data is to be represented using a pie chart, calculate the angle of the sector which represents '3 hours'.