

Answer **all** the questions.

1. [simple]

(a) Find $(\sqrt[3]{729})(4.937)$. Write down all the figures on your calculator display.

Answer: _____ [1]

(b) Write your answer to part (a) correct to 3 significant figures.

Answer: _____ [1]

2. [simple]

(a) The first five terms of a sequence are

6, 9, 14, 21, 30,

Find

(i) the 7th term,

Answer: _____ [1]

(ii) If the n^{th} term is given by $n^2 + x$, determine the value of x .

Answer: $x =$ _____ [1]

(b) Write down the first two terms of another sequence, whose n^{th} term is $3 - 2n^2$

Answer: _____ [2]

3. **[simple]**

A zoo has 112 visitors. The ratio of the number of men to women is 8: 6 and the ratio of the number of women to children is 3: 1.

If there are 3 boys, what is the ratio of the number of men to girls?

Answer: _____ [3]

4. **[simple]**

Farmer Jones drew a plan of his new cornfield, using 4 cm on the plan to represent 100 metres in the cornfield.

(a) Express the scale in the form 1 : n .

Answer: _____ [2]

(b) Find the actual area of the cornfield, in m^2 , of the cornfield if the area of the plan is 65 cm^2 .

Answer: _____ [2]

5. **[moderate]**

A night cyclist left his home at 11:50 pm and cycled to the nearest park, 5 km away, at an average speed of 12 km/h.

What time will he arrive at the park? Give your answer in 24-hour format.

Answer: _____ [2]

6. **[moderate]**

Tap A can fill up a water tank in 5 min. Tap B can fill up the same tank in 10 min.

How long will it take for both taps to fill up the same tank at the same time?

Answer: _____ minutes [3]

7. **[simple]**

In a typing session, a typist is able to type at a rate of $(3x + 4)$ words per minute for 1.5 minutes.

In the next 2.5 minutes, the typist is able to type $(2x + 4)$ words per minute.

If the average speed of the typist during the session is $(2x + 7)$ words per minute, find the value of x .

Answer: $x =$ _____ [3]

8. **[moderate]**

(a) Factorise completely $xr^2 + xyr^2 - xr^3$

Answer: _____ [2]

(b) Solve $4c^2 = -c(4 - c)$

Answer: _____ [2]

9. [moderate]

(a) Express 120 as a product of its prime factors.

Answer: _____ [2]

(b) Find the highest common factor of 116 and 120.

Answer: _____ [2]

[moderate]

10 (a) Simplify $(5g^2)^3 \times \frac{5}{g}$

Answer: _____ [2]

(b) Expand and simplify $(3h - 4)(h - 3)$

Answer: _____ [2]

(c) Given that $64^{\frac{2}{3}} = 4^x$, find x .

Answer: _____ [2]

11. **[difficult]**

Given the formula $xyw = x(y - w) + 5wy$,

(a) make x the subject of the formula.

Answer: _____ [2]

(b) find the value of x when $y = 2$ and $w = -1$

Answer: _____ [2]

12. **[moderate]**

(a) Solve the inequality $19.6 \geq \frac{3}{2}x$ and represent your solution on the number line below.

Answer: _____ [2]

(b) Solve $6x(x + 1) = 5x^2$

Answer: _____ [3]

13. [simple]

A fair die is thrown.

Find the probability of getting

(a) a zero,

Answer: _____ [1]

(b) a multiple of 2,

Answer: _____ [1]

14. [moderate]

	Sat	Sun	Mon	Tue	Wed
Beijing	1°C	2°C	-3°C	0°C	-5°C
Singapore	25°C	28°C	27°C	32°C	35°C

The table above shows the lowest temperatures in the 2 cities for 5 consecutive days.

(a) Write down the lowest temperature in Beijing during these 5 days.

Answer: _____ °C [1]

(b) On which day is the difference in temperature between the 2 cities the

(i) greatest?

Answer: _____ [1]

(ii) smallest?

Answer: _____ [1]

(c) Find the average temperature of Beijing for the 5 days.

Answer: _____ °C [1]

15. **[moderate]**

A taxi operator, BRAG charges 66 cents per km, including a flag-down fare of \$2.80. The total cost of taxi fare for travelling n km is \$ C .

(a) Write a formula for C in terms of n .

Answer: _____ [2]

(b) If the total cost of taxi fare is \$14.68, what was the distance travelled by the taxi?

Answer: _____ km [2]

(c) Calculate the taxi fare if the distance travelled by a taxi is 32.65 km.

Answer: \$ _____ [2]

16. **[moderate]**

(a) Find the number of sides in n -sided regular polygon that has interior angles of 144° .

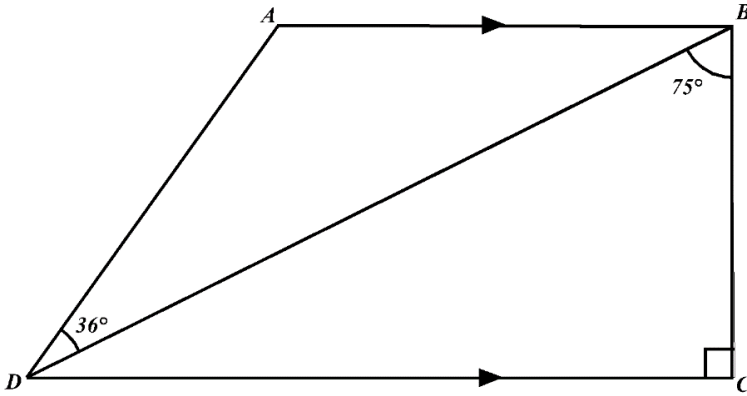
Answer: _____ [2]

(b) A 9-sided polygon has 8 interior angles of 150° . Find the remaining interior angle.

Answer: _____ [2]

17. [moderate]

$ABCD$ is a trapezium with AB parallel to CD .



Angle $DBC = 75^\circ$ and Angle $ADB = 36^\circ$.

(a) Find

(i) Angle ABD ,

Answer: _____ [1]

(ii) Angle DAB ,

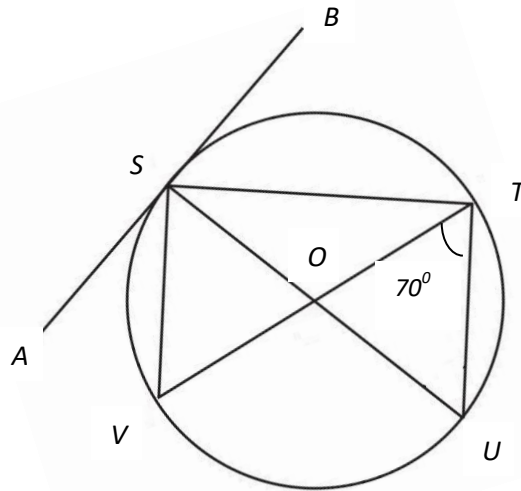
Answer: _____ [1]

(b) Find the length BD if BC is 6 cm.

Answer: _____ [1]

18. [moderate]

The points S , T , U and V lie on the circumference of the circle with centre O . The lines SU and TV meet at O . AB is a line tangent to the circle at S .



Find

(a) Angle BSU

Answer: _____ [1]

(b) Angle VST

Answer: _____ [1]

(c) Angle VOU

Answer: _____ [1]

(d) Angle VSU

Answer: _____ [1]

(e) Angle TSU

Answer: _____ [1]

19. **[moderate]**

Tom loaned \$2000 from a bank and planned to repay \$2084 at the end of the third year. If the bank charged simple interest, find the interest rate per annum.

Answer: _____ % [2]

20. **[difficult]**

A line L_1 , passes through points $A(5, -3)$ and $B(-2, 11)$.

(a) Find the length of the line segment AB .

Answer: _____ units [2]

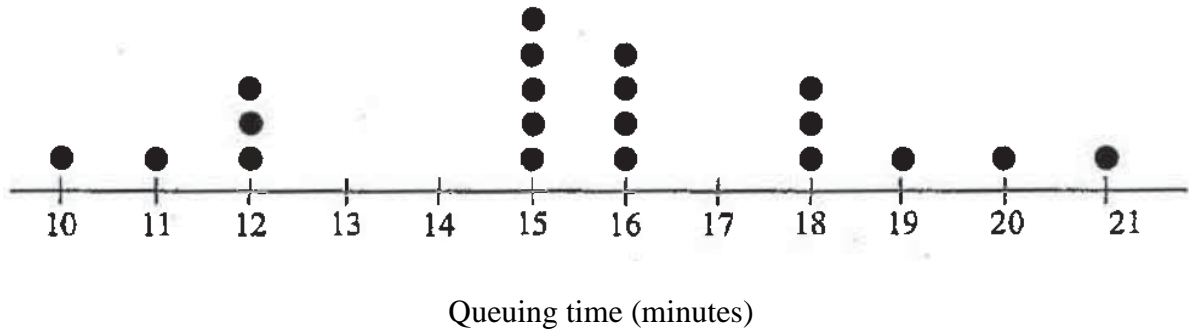
(b) Find the gradient of the line, L_1 .

Answer: _____ [2]

(c) Another line L_2 , passing through the point $(0, -5)$ is parallel to the line L_1 . Find the equation of the line L_2 .

Answer: _____ [3]

21. The queuing times (in minutes) of 20 fans at a ticketing booth are as shown below.



(a) Find the mode.

Answer: _____ min [1]

(b) Find the percentage of fans who waited for at least 18 minutes.

Answer: _____% [1]
