Set 31

Interpreting Graphs

These are the sections you must complete in this set:

- ✓ **Topic Questions**
- ✓ **Problem Solving**
- ✓ **Challenge Questions**

Cartesian planes

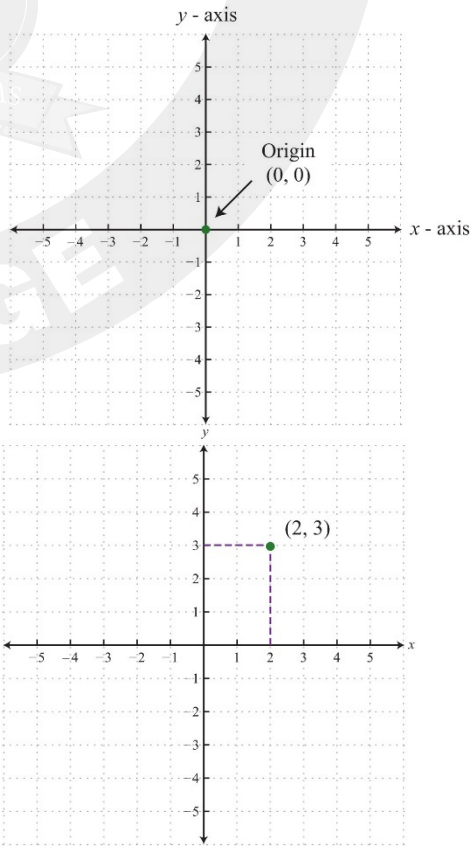
Graphs are a useful way of displaying data and numerical information. The use of graphs makes the data easier to understand than written information. However, without skills in reading graphs, we may receive the wrong impression from a graph or may not understand what it is showing.

A line graph is formed by joining a series of data points which have been plotted using a system of **cartesian coordinates**. This system is similar to grid references on a map, giving a horizontal and vertical position to mark the exact position of a point. These points are plotted on a 2D plane known as the **cartesian plane** or the number plane.

The cartesian plane consists of two number lines that intersect at right angles. The horizontal number line is called the ***x*-axis**, and the vertical number line is called the ***y*-axis**. The intersection of the two axes is known as the **origin**, which corresponds to the point (0, 0).

A point on the plane is identified by an **ordered pair** of numbers in the format (x, y), where the first number is called the ***x*-coordinate**, and the second number is called the ***y*-coordinate**.

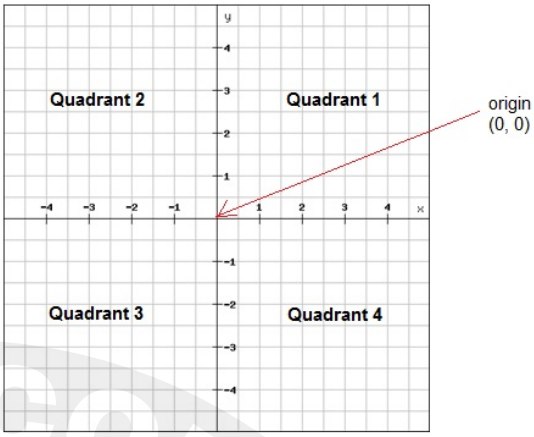
For example, the point (2, 3) has an x-coordinate of 2 and a y-coordinate of 3, as shown on the right.



The cartesian plane is split into four quadrants, which are numbered 1 to 4.

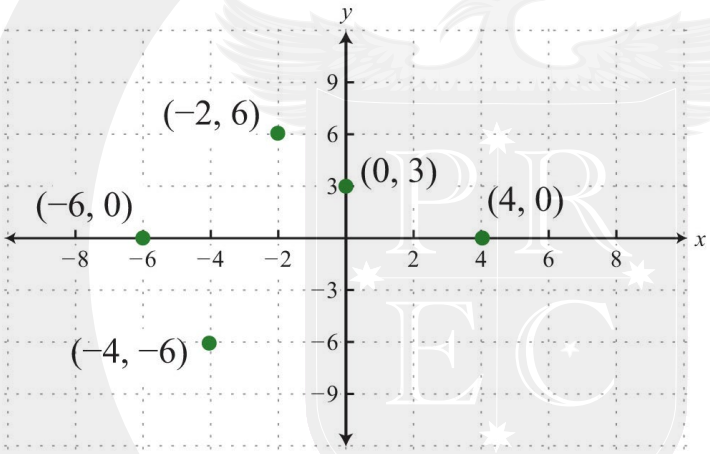
Starting in the top right section of the plane, the numbers go in an anticlockwise direction as shown in the diagram on the right.

Note that points that lie on an axis do not belong to any quadrant.

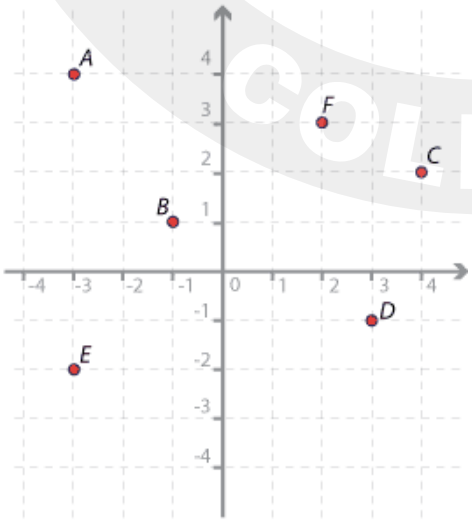


Example: Plot the following set of ordered pairs.

$$\{ (4, 0) , (-6, 0) , (0, 3) , (-2, 6) , (-4, -6) \}$$



Example: Give the coordinates for each of the following points.



A = (− 3, 4)

B = (− 1, 1)

C = (4, 2)

D = (3, − 1)

E = (− 3, − 2)

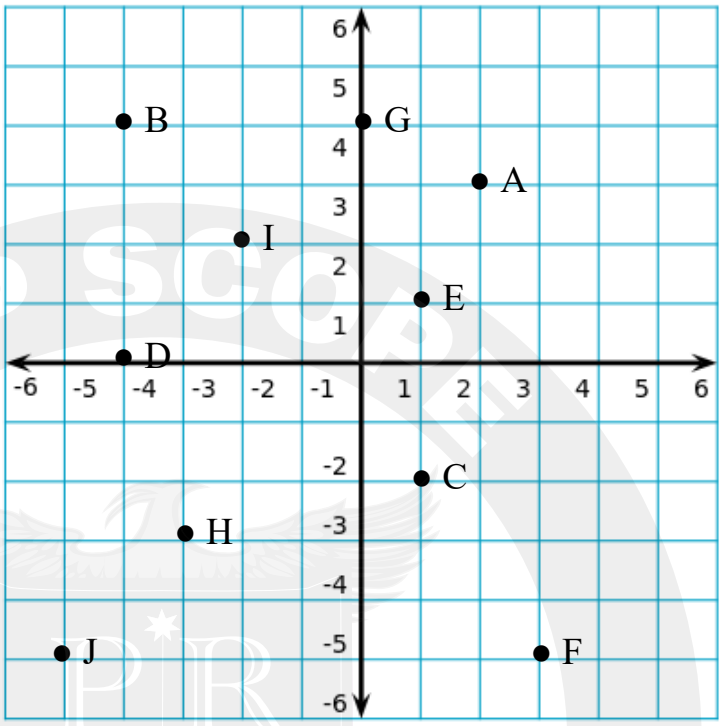
F = (2, 3)

Example: For the previous example, state which quadrant each point belongs to.

Points C and F are in quadrant 1, points A and B are in quadrant 2, point E is in quadrant 3 and point D is in quadrant 4.

Topic Questions

1. Plot the following ordered pairs:



A = (2, 3)

B = (− 4, 4)

C = (1, − 2)

D = (− 4, 0)

E = (1, 1)

F = (3, − 5)

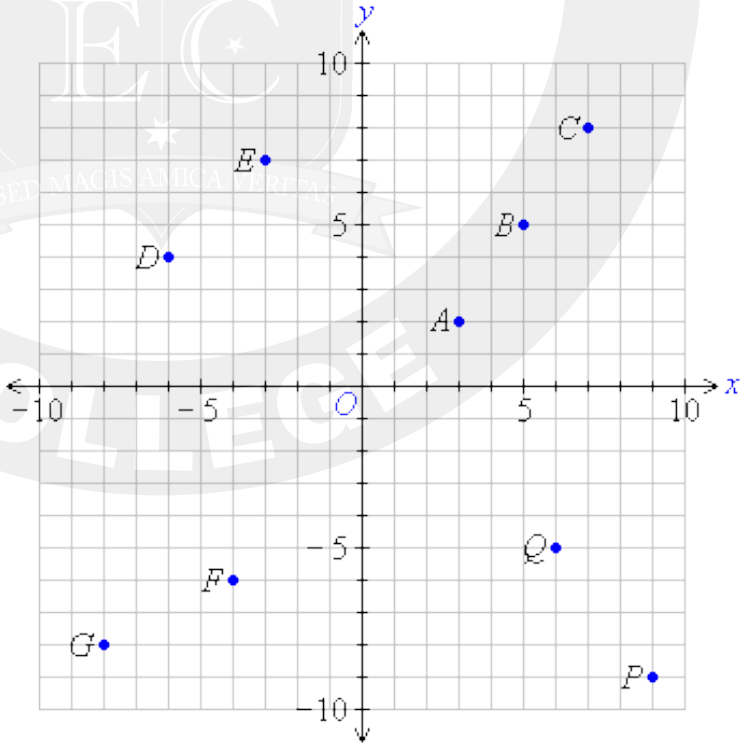
G = (0, 4)

H = (− 3, − 3)

I = (− 2, 2)

J = (− 5, − 5)

2. State the following coordinates:



A = (3, 2)

B = (5, 5)

C = (7, 8)

D = (− 6, 4)

E = (− 3, 7)

F = (− 4, − 6)

G = (− 8, − 8)

P = (9, − 9)

Q = (6, − 5)

3. Which quadrants do the following points lie in ?

(a) (− 2, 7) Q2 **(b)** (4, − 3) Q4 **(c)** (− 3, − 6) Q3 **(d)** (5, 3) Q1

(e) (− 5, − 9) Q3 **(f)** (− 1, 8) Q2 **(g)** (12, − 5) Q4 **(h)** (0, 3) None

Problem Solving

1. Gina caught the 7:30 am train from Melbourne and arrived in Adelaide at 5:45 pm. If the train travelled at an average speed of 72 km/h, what distance did the train travel ?

Answer: 738 kms

2. A coin weighs 2.5 grams. If a piggy bank weighs 250 grams when empty, how many coins does it contain if the same piggy bank now weighs 1.65 kilograms ?

Answer: 560 coins

3. A swimming pool is two-fifths full. When 225 litres of water is added to the pool, it increases to half full. What is the total capacity of the pool in litres ?

Answer: 2 250 litres

4. Benjamin is at a work conference from 9:30 am to 5.00 pm. If he meets 330 people in total, how many people, on average, does he meet per hour ?

Answer: 44 people per hour

5. Jackie works five days per week. She spends $4.30 on a coffee each morning and pays $8.75 for a train ticket each day. How much does she spend on coffee and tickets each week ?

Answer: $65.25 per week

6. James has 108 balls in total sitting in a sporting locker. He finds that there are five times as many tennis balls as there are baseballs. How many baseballs are there in the locker ?

Answer: 18 baseballs

7. What is a quarter of a half of a sixth of 1728 ?

Answer: 36

Challenge Questions

1. Jonathan is saving to buy a skateboard which costs \$150. He has 3 \$20 notes, 4 \$10 notes, 5 \$5 notes, 6 \$2 coins, 5 \$1 coins, 3 50c coins, 4 20c coins and 7 5c coins. Does Jonathan have enough money to buy the skateboard? If not, how much more does he need to save ?

Answer: No. Jonathan needs to save \$5.35 more.

2. The cost of 25 theatre tickets is \$323.75. Calculate the cost of 10 of these tickets.

Answer: \$129.50

3. Calculate the total cost of 60 litres of petrol at 125.5 cents per litre. If the petrol was paid in cash, how much change would you receive from \$100 ?

Answer: The petrol costs \$75.30 and the amount of change is \$24.70

4. A child's ticket to the zoo costs \$19 and an adult ticket costs \$38. How much will a family of 2 adults and 3 children have to pay ? If a family ticket costs \$104.50, how much can they save by choosing this option ?

Answer: \$133 but could save \$28.50 using the family ticket option.

5. Devlin purchased a motorbike costing \$5 765. He paid a deposit of \$500 and then paid the remainder in 15 equal instalments. How much was each instalment ?

Answer: \$351

6. What will be the 200th letter in the pattern below ?

A B C D E F A B C D E F A B C D E F A ….

Answer: B

7. There is a group of people in a meeting room. Each person shakes the hand of every other person in the room only once. If there was a total of 45 handshakes, how many people are in the room ?

Answer: 10 people

Set 32

Line Graphs

These are the sections you must complete in this set:

- ✓ **Topic Questions**
- ✓ **Problem Solving**
- ✓ **Challenge Questions**

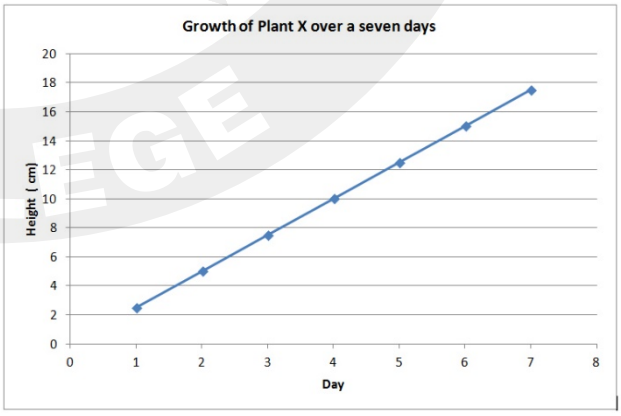
What are line graphs ?

Line graphs display how one quantity varies in relation to another quantity. These two quantities are known as **variables**. Typically, on many graphs, these variables are called x and y since a line graph is formed by joining the cartesian points given by the data with straight lines. There are two types of variable, namely, the **independent variable** and the **dependent variable**.

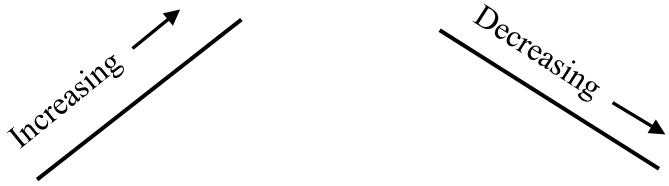
Since the dependent variable depends on the independent variable, the independent variable is placed on the horizontal axis and the dependent variable is placed on the vertical axis.

A line graph is typically used to show the change of a quantity over a period of time**.** This means that the horizontal axis is usually a time scale**,** for example, minutes, days, months or years.

Example: The line graph on the right shows the growth of a particular plant over a period of 7 days.
The height of the plant depends on the number of days; thus time is the horizontal axis and height is the vertical axis.

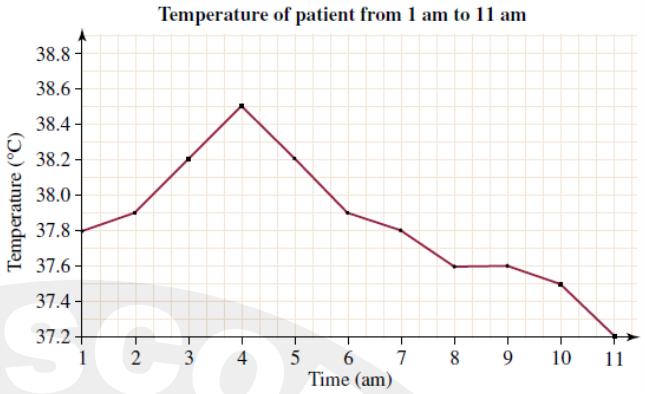


Line graphs are also useful for observing trends. An uphill (positive) slope indicates an increasing trend and a downhill (negative) slope indicates a decreasing trend.



Topic Questions

Refer to the line graph on the right to answer the following questions:



1. What is the highest temperature ?

Answer: 38.5°C

2. At what time did this occur ?

Answer: 4 am

3. Between what times was the temperature increasing ?

Answer: 1 am to 4 am

4. What was the trend of the temperature after 4 am ?

Answer: Decreasing

5. Between what times was the patient's temperature 38°C and above ?

Answer: 2:20 am to 5:40 am

6. If 37.5°C and below is considered a normal temperature, at what time did the patient return to this temperature ?

Answer: 10 am

Each month I weigh my dog and the results are shown in the table on the right.

Month	Weight
Jan	25
Feb	20
Mar	25
Apr	30
May	30
Jun	35

7. What was the weight of my dog in March ?

Answer: 25 kgs

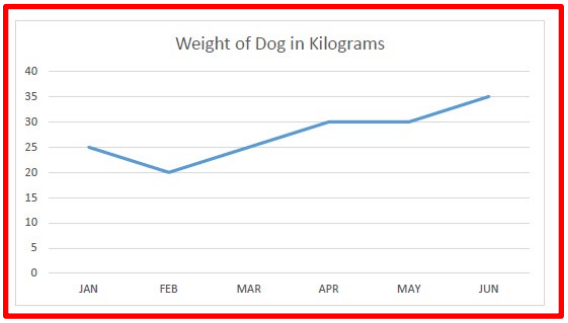
8. What is the range of weights for my dog ?

Answer: Range = 35 − 20 = 15 kgs

9. What was the highest weight for my dog and in which month did this occur ?

Answer: 35 kgs in June

10. Construct a line graph for the data in the table.



Problem Solving

1. At the supermarket, avocados sell for $20 per kilogram. How much would you pay if you bought an avocado that weighed 625 grams ?

Answer: $12.50

2. Jessica's jumper cost $80 but she purchased it during a sale for $56. What percentage of the original price was the jumper reduced by ?

Answer: 30 %

3. Sandra paid a total of $111.10 for the online purchase of a textbook. If the total cost included a 10% shipping fee, what was the cost of the textbook before the shipping fee was added ?

Answer: $101.00

4. John has a piece of rope that is 7.5 metres long. He wants to cut it into small pieces that are each 15 centimetres long. How many of the smaller pieces will John have ?

Answer: 50

5. Penny has 900 marbles. 150 of the marbles are white and the rest are black. Find the ratio of the number of white marbles to the number of black marbles in simplest form.

Answer: 1 : 5

6. If a square has an area of 225 cm^2, what is its perimeter ?

Answer: 60 cm

7. A farmer had some cows and chickens. He counted 80 heads and 210 legs. How many cows and chickens are there on the farm ?

Answer: 25 cows and 55 chickens

Challenge Questions

1. The length and width of a rectangle are both increased by 40 %. Find the percentage increase in the area of the new rectangle when compared to the original rectangle.

Answer: 96 %

2. Danny wanted to take his four friends fishing. The hire of the boat was \$72 per hour and the hire of the fishing rods was \$15 per person. The cost of petrol was \$85 and the cost for the bait was \$32. If the fishing trip lasted $3\frac{1}{4}$ hours, how much did Danny pay in total ?

Answer: \$234 + \$75 + \$85 + \$32 = \$426

3. A sailor calculates that his boat costs him \$936 per year for maintenance. In addition, he pays \$1 200 per year for boat registration and a docking rent of \$628 per month. If he spends \$42 per week on petrol, what is the weekly cost that the sailor pays to have the boat ?

Note: Use the conversion 1 year = 52 weeks in your calculations.

Answer: \$228.00 per week

4. Two years ago, Bill was twice Tom's age. In eight years' time, Tom will be three-fifths of Bill's age. What ages are Bill and Tom at present ?

Answer: Bill is 42 years old and Tom is 22 years old.

5. If a letter is chosen from the word PROBABILITY, what is the chance that it is a B ?

Answer: $\frac{2}{11}$

6. Find the area, in hectares, of a paddock with dimensions 250 metres by 320 metres.

Answer: 8 hectares

7. Rohit has driven 125 km in 2 hours and has jogged 5 km in 30 minutes. What was Rohit's average speed for the entire journey ?

Answer: 52 km/h

🎯 Set 33

3D Shapes

These are the sections you must complete in this set:

- ✓ **Topic Questions**
- ✓ **Problem Solving**
- ✓ **Challenge Questions**

Introduction to 3D shapes

Solid geometry is the study of three-dimensional space and shapes, the kind of space that we live in. It is called three-dimensional, or 3D, because there are three dimensions, namely, length, width and depth (or height).

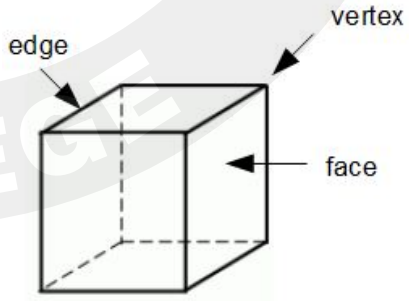
There are two main types of solids:

- **Polyhedrons** (or polyhedra) are solids where all surfaces must be flat.
- **Non-Polyhedrons** (or non-polyhedra) are solids where any surface is not flat.

Polyhedrons

These types of solids have three parts, namely, faces, edges and vertices.

- A face is a flat polygon surface.
- An edge is a line joining two faces.
- A vertex, or corner, is the point where two or or more edges meet.



There is a special formula, known as **Euler's formula**, that links the number of faces, edges and vertices for any polyhedron.

$$F + V - E = 2$$

Example: Calculate the number of vertices for a polyhedron with 7 faces and 15 edges.

Using Euler's theorem: $V = E - F + 2$

$\therefore$ The number of vertices $= 15 - 7 + 2 = 10$.

There are three subgroups of polyhedrons, namely, **prisms**, **pyramids** and **other polyhedrons**.

Prisms

A **prism** is a polyhedron with the following properties:

- it has two identical parallel faces that are polygons (called the base and the top)
- all other faces are rectangles
- and it has a **uniform cross-section**.

A uniform cross-section means that when you take slices through the solid parallel to the base, you get polygon shapes that are identical to the base. So the area of each slice is always the same.

Prisms are named after the shape of their base. A prism with a base in the shape of a hexagon is called a hexagonal prism. However, some special names are used such as a cube (square prism) and a cuboid (rectangular prism).

Pyramids

A **pyramid** is a polyhedron with the following properties:

- it has a base that is the shape of a polygon
- all the sloping faces are triangles
- and the triangular sloping faces meet at one vertex called the **apex**.

Pyramids are named after the shape of their base. For example, a pyramid with a base in the shape of a square called a square-based pyramid or a square pyramid.

Non-Polyhedrons

These are solids where any surface is not flat. Examples of these include spheres, cylinders, cones and any other solid that contain a curved surface.

A **cylinder** is a special type of non-polyhedron as it has many properties similar to a prism:

- it has two identical parallel faces, the base and top, that are circles
- and it has a **uniform cross-section**.

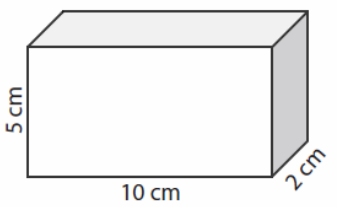
However, since the parallel sides are circles rather than polygons, a cylinder is not considered to be a prism. In addition, the side of the cylinder is a curved surface in the shape of a tube or pipe.

Therefore, a cylinder is not a prism, however it is extremely similar.

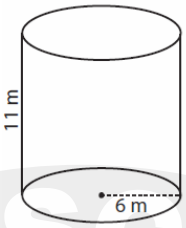
Topic Questions

1. State whether each of the following solids is a polyhedron (P) or a non-polyhedron (N):

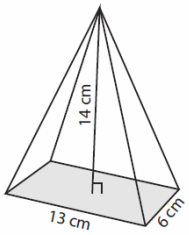
(a) P



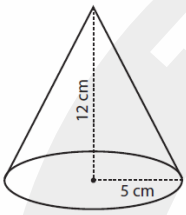
(b) N



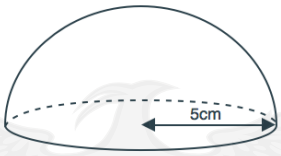
(c) P



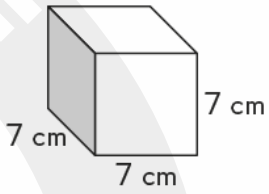
(d) N



(e) N



(f) P



2. State which of the solids in the previous question are prisms ?

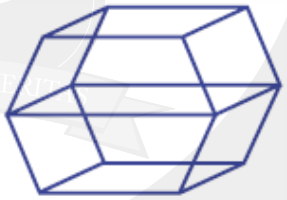
Answer: Only (a) and (f). Note that a cylinder is not a prism.

3. For each of the following polyhedrons, state the number of faces, edges and vertices.

(a)

F = 8 , E = 12 , V = 6

(b)



F = 10 , E = 20 , V = 12

4. A polyhedron has 10 faces and 8 vertices. How many edges does it have ?

Answer: 16 edges

5. A polyhedron has 6 faces and 12 edges. How many vertices does it have ?

Answer: 8 vertices

6. Is it possible to have a polyhedron with 10 faces, 6 edges and 4 vertices ?

Give reasons for your answer.

Answer: No. Since $F + V - E \neq 2$

Problem Solving

1. I bought a dozen tins of tennis balls for \$39. How much does each tennis ball cost ? How much will 12 dozen tins cost ?

Answer: \$3.25 each and \$368 for 12 dozen tins.

2. Tom bought presents for his friends. One fifth of the wrapping paper was needed to wrap a single present. If all the presents have the same dimensions, how many presents can Tom wrap if he has three sheets of wrapping paper ?

Answer: 15 presents

3. The dimensions of a concrete paver are 25 cm long, 12 cm wide and 6 cm deep. What is the volume of the concrete paver ?

Answer: 1 800 cm^3

4. A year level of 120 students sat a test and 30 % of the students failed. For those who failed, an extra tutorial was given and only those students had to sit a second test. For the second test, one quarter failed and the rest passed. How many students failed both tests ?

Answer: 9 students failed both tests

5. If $a = -4$ and $b = 7$, find the value of $3a - 5b$.

Answer: -47

6. A rectangular prism has a volume of 1500 cm^3. If the length of the prism is 25 cm and the width is 8 cm, calculate height of the prism.

Answer: 7.5 cm

7. There are 18 trees planted 75 cm apart in a straight line. Find the distance in metres between the first and the last tree.

Answer: 12.75 metres

8. If $\frac{2}{9}$ of a number is 72, what is the number ?

Answer: 324

Challenge Questions

1. Find the side length of a cube whose volume is 512 cm^3.

Answer: 8 *cm*

2. A small cube has dimensions 4 cm × 4 cm × 4 cm. Calculate the number of small cubes that would fit into a rectangular box with dimensions 16 cm × 20 cm × 30 cm.

Answer: 140 small cubes

3. A train travels at an average speed of 80 km/h when in motion on a trip to a country town. The train departs at 8:00 am and arrives at 3:30 pm. If the train only stops at three stations, each for a duration of 5 minutes, what is the total distance of the trip ?

Answer: 580 kms

4. 294 blue balls, 252 pink balls and 210 yellow balls are distributed equally among some students with none left over. What is the largest possible number of students ?

Answer: 42

5. Maggie has 3 game scores which happen to be square numbers. The first 2 scores have the same 3 digits. The total of the 3 scores is 590. What are the 3 scores ?

Answer: 169, 196 and 225

6. In a class election with 3 candidates, the winner beat the other 2 candidates by 3 and 6 votes, respectively. If 27 votes were cast, how many votes did the winner receive ?

Answer: 12

7. The difference between the squares of two consecutive odd numbers is 64.
What are the two odd numbers ?

Answer: 15 and 17

Set 34

Net Diagrams

These are the sections you must complete in this set:

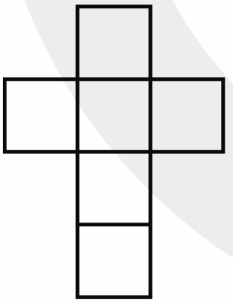
- ✓ **Topic Questions**
- ✓ **Problem Solving**
- ✓ **Challenge Questions**

What is a net ?

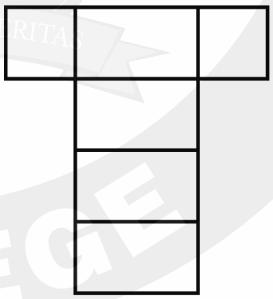
To understand the composition of polygonal faces that make up a 3D solid, we must first imagine that the surface has been unfolded and laid flat. This process of unfolding or flattening creates a **net diagram** which is simply a collection of simple 2D shapes. These net diagrams are useful for calculating the total surface area of a solid by adding the area of each individual 2D shape.

For example, to find the surface area of a cube, a net diagram shows that it comprises 6 squares.

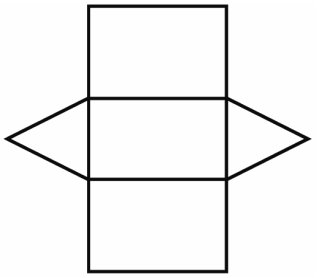
Depending on how you unfold a prism, net diagrams can differ to those shown below.



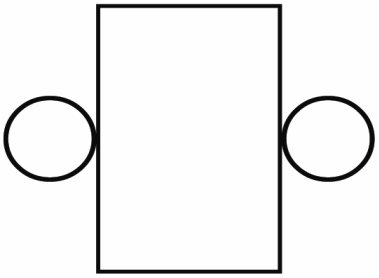
Cube



Rectangular prism or cuboid



Triangular prism



Cylinder

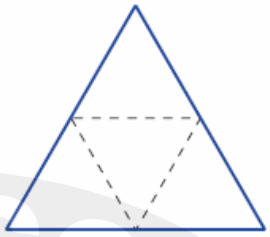
Topic Questions

1. Name the solids that correspond to the following net diagrams:

(a)

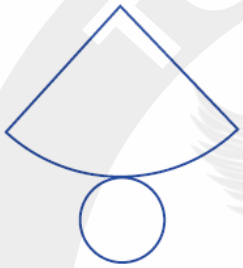
Square pyramid

(b)



Triangular pyramid

(c)

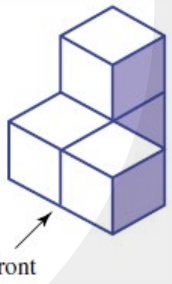


Cone

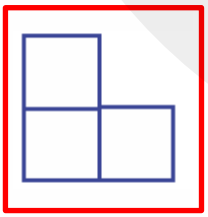
(d)

Hexagonal pyramid

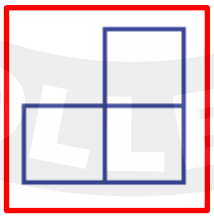
2. The solid on the right is constructed using four cubes.
This object can be viewed from many different angles.
Construct 2D plans showing the view you would see
from the following angles:



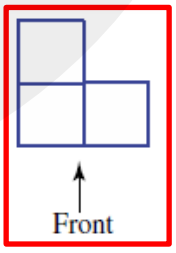
(a) the front view



(b) the right view

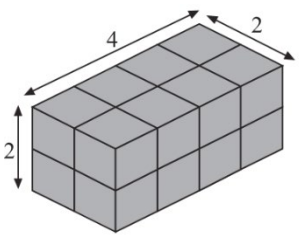


(c) the top view

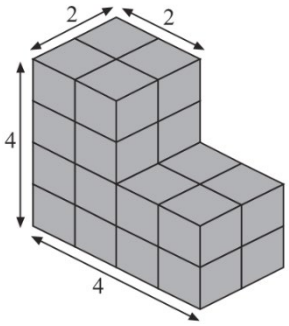


3. How many smaller cubes are there in each of the following solids:

(a) 16

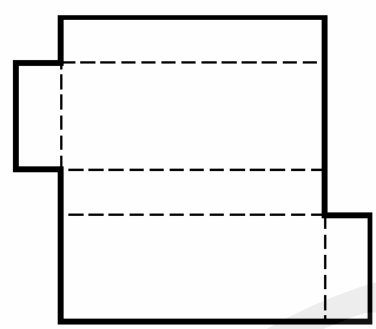


(b) 24



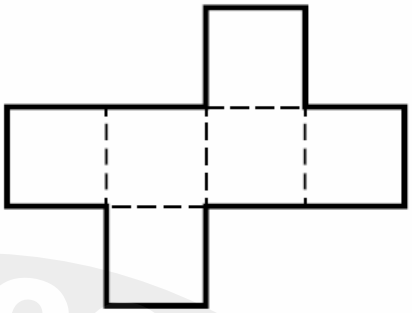
4. Name the solids that correspond to the following net diagrams:

(a)



Rectangular prism

(b)

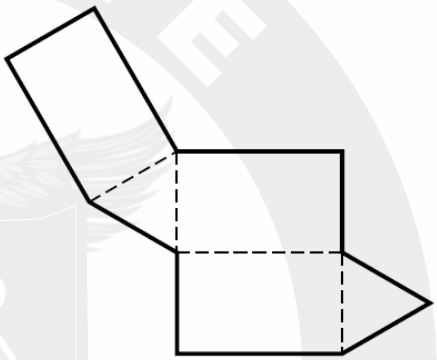


Cube

(c)

Cone

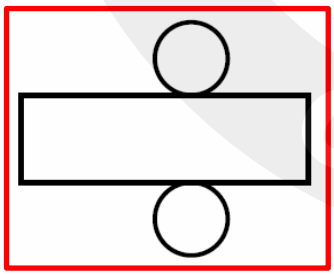
(d)



Triangular prism

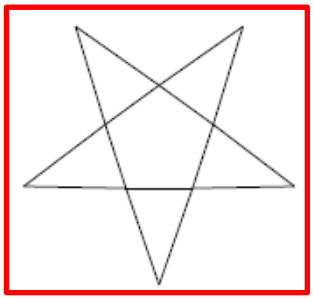
5. Draw net diagrams for the following solids.

(a) Cylinder

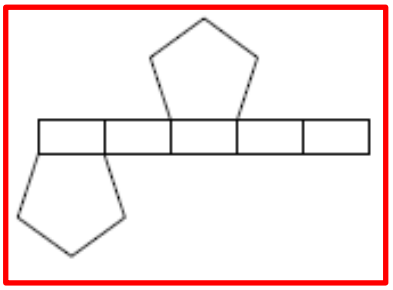


(b) Square-based pyramid

(c) Pentagonal pyramid



(d) Pentagonal prism



Problem Solving

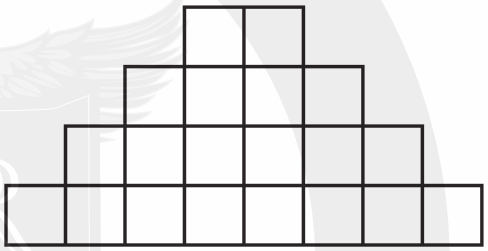
1. Shane works for seven and a half hours a day for six days. If he earns a total of $1 080 for those days, how much per hour does he get paid ?

Answer: $24 per hour

2. What is the volume of a rectangular prism that has a length of 15 cm, a width of 8 cm and a height of 12 cm ?

Answer: 1 440 cm^3

3. The area of each square in the diagram on the right is 9 cm^2.



What is the perimeter of the shape ?

Answer: 72 cm

4. Rank the states and territories of Australia in descending order of area.

States and Territories	Area
Queensland	1 727 200 km^2
New South Wales	801 600 km^2
Victoria	227 600 km^2
ACT	2 400 km^2
Western Australia	2 525 500 km^2
South Australia	984 000 km^2
Tasmania	67 800 km^2
Northern Territory	1 346 200 km^2
1 km^2 = 1 000 000 m^2	

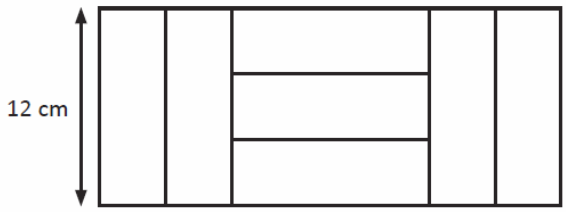
Answer: WA, Queensland, NT, SA, NSW, Victoria, Tasmania, ACT

5. What is the total area of Australia in square kilometres ?

Answer: 7 682 300 km^2

Challenge Questions

1. The area of the large rectangle is 336 cm³. If all the smaller rectangles are exactly the same, what is the perimeter of one of the smaller rectangles ?



Answer: 32 cm

2. Kerry wants to buy a jacket that normally sells for \$160, but there is a sale that will reduce the price by 25 %. When she is paying for the jacket, she is told that there is a further 10 % off the reduced price. How much does Kerry pay for the jacket ?

Answer: \$108.00

3. Solve the following: $5 \times -2 - (8 - 12) + 16 \div -8$

Answer: -8

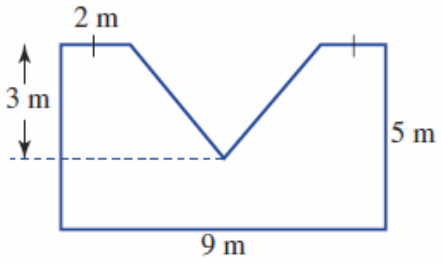
4. Which is the longest distance ? *Answer:* E

A 3 500 cm **B** 65.5 m **C** 0.1 km **D** 15.5 m **E** 75 000 mm

5. A builder recently sold a townhouse for \$450 000. He has to pay an agent 5 % commission on the first \$100 000 followed by a 2.5 % commission on the remaining \$350 000. How much commission will the builder pay in total ?

Answer: \$13 750

6. Calculate the area of the shape on the right.



Answer: 37.5 m²

🎯 Set 35

Surface Area

These are the sections you must complete in this set:

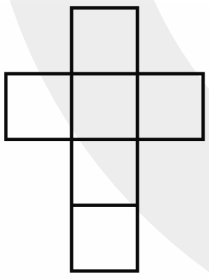
- ✓ **Topic Questions**
- ✓ **Problem Solving**
- ✓ **Challenge Questions**

Introduction to surface area

Surface area is the sum of the areas of all faces (or surfaces) on a 3D shape or solid. In other words, it represents the total outside area of the 3D shape. We use the term **total surface area**, or the abbreviation TSA, to represent the sum of the outside areas.

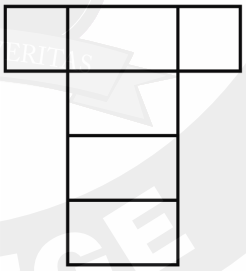
As seen in the previous set, we make use of **net diagrams** in order to calculate the total surface area of a 3D shape. We calculate the surface area by adding the area of each individual 2D shape.

This set will focus on the total surface area for the following 3D shape and solids:



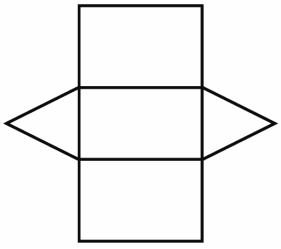
Cube

TSA $= 6 \times l^2$



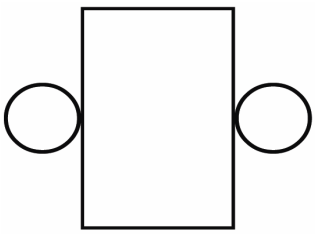
Rectangular prism or cuboid

TSA $= 2(l \times h + l \times w \times w \times h)$



Triangular prism

TSA = 2 triangles + 3 rectangles



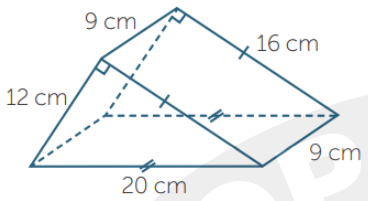
Cylinder

TSA $= 2\pi r^2 + 2\pi r h$

Example: Find the total surface area of a cube with an edge length of 8 cm.

TSA $= 6 \times l^2 = 6 \times 8\text{ cm} \times 8\text{ cm} = 384\text{ cm}^2$.

Example: Find the total surface area of the following triangular prism.



First, find the area of the two identical triangles at the front and back

Area 1 $= 2 \times \frac{1}{2} \times b \times h$

$= 2 \times \frac{1}{2} \times 16\text{ cm} \times 12\text{ cm}$

$= 192\text{ cm}^2$

Next, find the area of the three rectangles.

Area 2 $= (9\text{ cm} \times 16\text{ cm}) + (9\text{ cm} \times 12\text{ cm}) + (9\text{ cm} \times 20\text{ cm})$

$= 144\text{ cm}^2 + 108\text{ cm}^2 + 180\text{ cm}^2$

$= 432\text{ cm}^2$

TSA = Area 1 + Area 2 $= 192\text{ cm}^2 + 432\text{ cm}^2 = 624\text{ cm}^2$

$\therefore$ The total surface area of the triangular prism is 624 cm^2.

Topic Questions

1. Find the total surface area for cubes with the following side lengths:

(a) 3 cm — 54 cm²

(b) 5 m — 150 m²

(c) 1.2 cm — 8.64 cm²

(d) 8 cm — 384 cm²

(e) 1.1 m — 7.26 m²

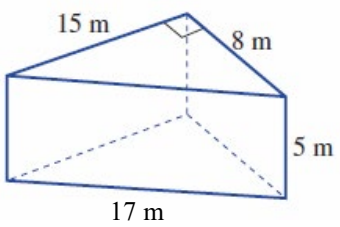
(f) 50 cm — 15 000 cm²

2. Find the total surface area of a rectangular prism which has dimensions of 10 centimetres by 8 centimetres by 5 centimetres.

Answer: 340 cm²

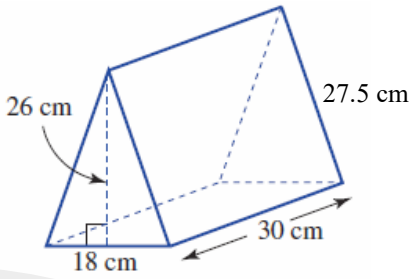
3. Find the total surface area for the following triangular prism:

(a)



TSA = 320 m²

(b)



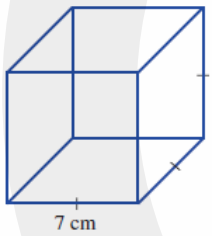
TSA = 2 658 cm²

4. If the surface area of a cube is 1 350 cm² , find the length of its side.

Answer: 15 cm

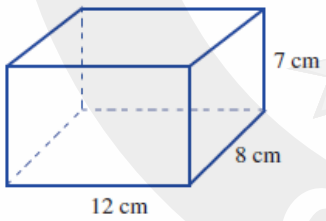
Calculate the surface area for the following:

5.



294 cm²

6.



472 cm²

7. A classroom at school is 12 metres long and 10 metres wide. If the ceiling is 3 metres high, find the total surface area that needs to be painted for the four walls and the ceiling.

Answer: 252 m²

8. Find the total surface area of a cylinder that has a radius of 10 centimetres and has a height of 20 centimetres. Use $\pi = 3$ for all your calculations.

Answer: 1 800 cm²

Problem Solving

1. Harley's motorbike consumes 8 litres of petrol every 100 kms travelled. He plans to travel 550 kms next weekend. How many litres of petrol will he need ?

Answer: 44 litres

2. My school bag weighs 975 grams when carrying my books and iPad. If my iPad weighs 185 grams and my books weigh 495 grams, how much does my bag weigh when empty.

Answer: 295 grams

3. Bob has a farm and has installed 5 empty water tanks to help conserve water. Each tank has a capacity of 60 000 litres and all were empty when installed. After a recent downpour, Bob noticed that two of the tanks were full and the other tanks were each 70 % full. How many kilolitres of water did Bob capture in the tanks ?

Answer: 246 kilolitres

4. A recent survey at a school reveals that one in twelve students have travelled overseas in the past year. If the school has 780 students, how many students have not been overseas ?

Answer: 715 students have not been overseas.

5. Benjamin is 4 years older than his sister. Twice Benjamin's age plus three times his sister's age equals 73. How old is Benjamin ?

Answer: Benjamin is 17 years old

6. A rectangular prism has a volume of 750 cm^3. If the length of the prism is 25 cm and the width is 5 cm, calculate height of the prism.

Answer: 6 cm

7. Consider two consecutive whole numbers. Twice the larger one plus three times the smaller one adds to 27. What are the two numbers ?

Answer: 5 and 6

Challenge Questions

1. The shortest side of a triangle is 6.2 cm less than the longest side. The remaining side has a length that is the average of the shortest and longest sides. The perimeter of the triangle is 26.7 cm. Find the length of the shortest side.

Answer: 5.8 cm

2. Ethan and Shiv are good friends. This year Ethan is 32 years older than Shiv. Nine years ago Ethan was three times Shiv's age. How old is Ethan at present ?

Answer: Ethan is 57 years old

3. Gillian's coffee cups have exactly two-fifths the capacity of her teacups. Using a 1.1 litre jug, Gillian filled five coffee cups and two teacups exactly. What is the capacity of one coffee cup and what is the capacity of one teacup ?

Answer: Coffee cup = 110 mL , tea cup = 275 mL

4. A survey was held to determine if students wanted cricket or basketball as their preferred sport. The results showed that 75 chose cricket, 59 chose basketball and 12 chose neither. Of the 123 students, what number chose both sports ?

Answer: 23 students chose both sports

5. If you won one million dollars and decided to spend the money at the rate of one dollar per minute, how long, to the nearest day, would it take you to spend all the money ?

Answer: 694 days

6. When looking in a mirror, the hands on a wall clock behind me appears to show the time as 25 minutes to 2 o'clock. What is the actual time on the clock ?

Answer: 25 minutes past 10

7. George works as a carpenter. He needs to cut lengths of timber that are 6 metres long into 2-metre lengths. Each saw cut takes 4 minutes. If the whole job is completed in 1 hour and 20 minutes, how many lengths of timber did he start with ?

Answer: 10