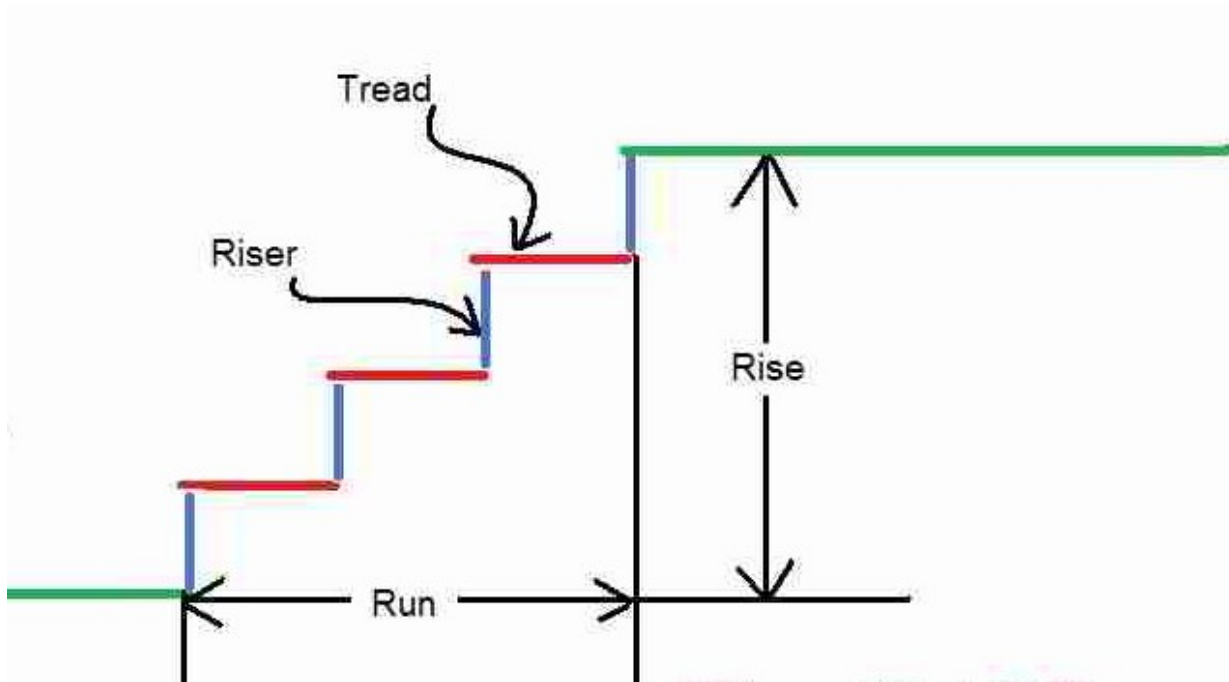




Subject: Grade 9 Technology
Topic: Technology: Term 2 - Exam 1
Total: 125 Marks

Name: _____
Date: _____

This image refers to question: 1, 2



Question 1: Text Input

3 marks

If the height of each riser in this image is 210mm, then what is the total height of the rise in mm?

Question 2: Text Input

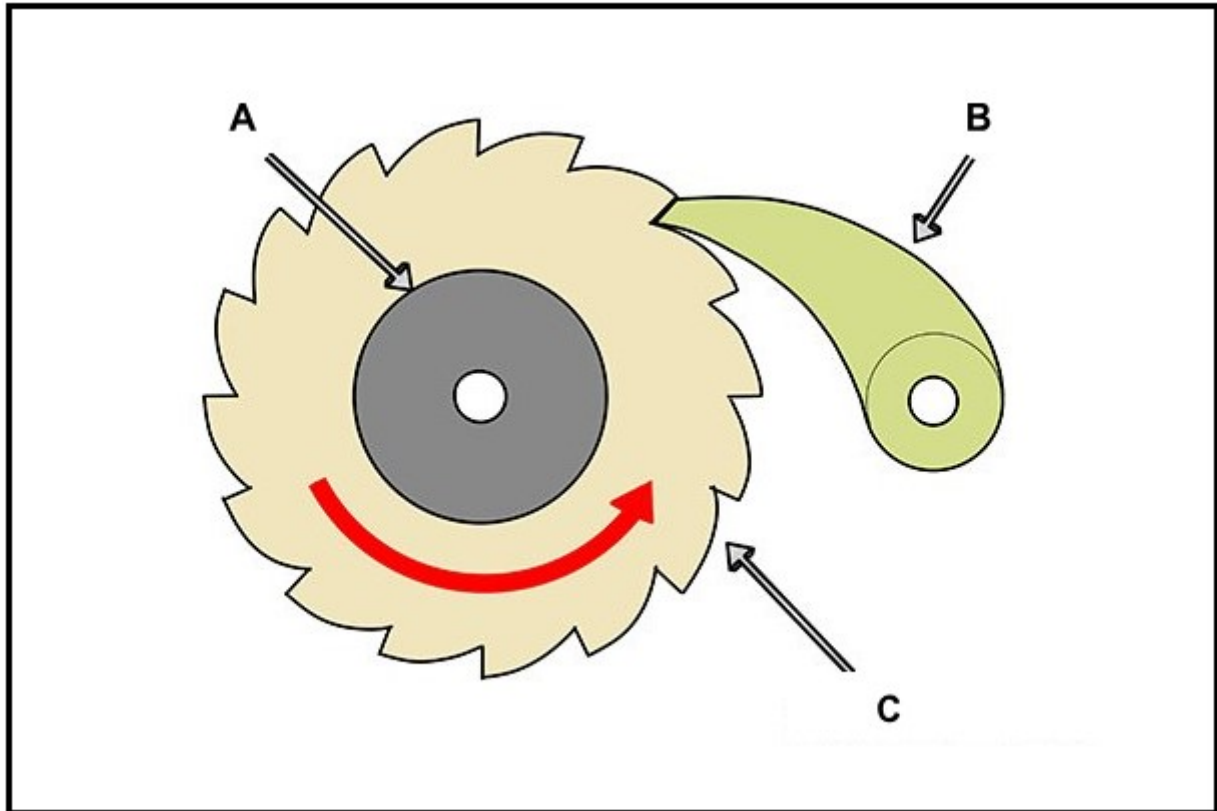
2 marks

If each tread measures 230mm, what is the dimension of the run in this staircase?

Note: Give your answer in millimetres.



This image refers to question: 3



Question 3: Text Input

3 marks

Provide the name of the part labelled B in this mechanism.

Note: Your answer will be one word only.

--

Question 4: Please Fill In The Blanks

6 marks

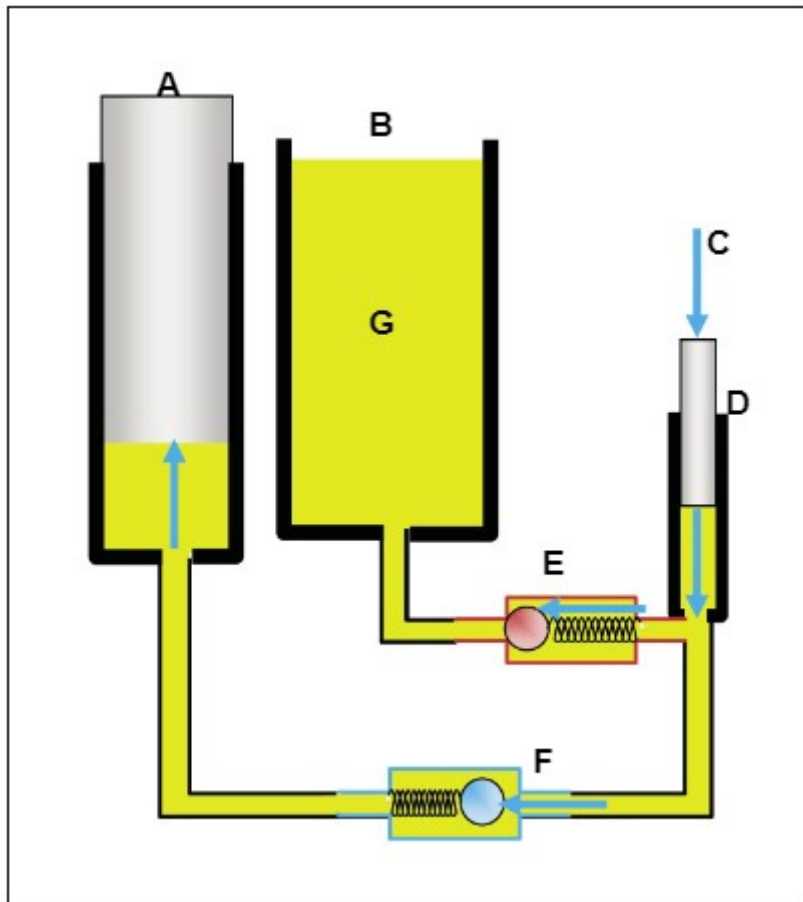
A (1) system is filled with air and a (2) system is filled with fluid. Both systems are used to transmit an input (3) to do work.

Possible Answers: force | hydraulic | load | pulley | gear | pneumatic

1	
3	

2	
----------	--

This image refers to question: 5, 6, 7



Question 5: True/False

2 marks

The parts labelled E and F in this image are pistons.

TRUE

FALSE

Question 6: Multiple Choice

4 marks

Which of these are the **CORRECT** labels for the **hydraulic system**?

- | | |
|----------|--|
| A | D = Input piston
G = Output piston
A = Force |
| B | D = Input piston
G = Output piston
A = Reservoir |
| C | D = Input piston
G = Fluid Reservoir
A = Output piston |
| D | D = Output piston
G = Reservoir
A = Input piston |

Question 7: Text Input

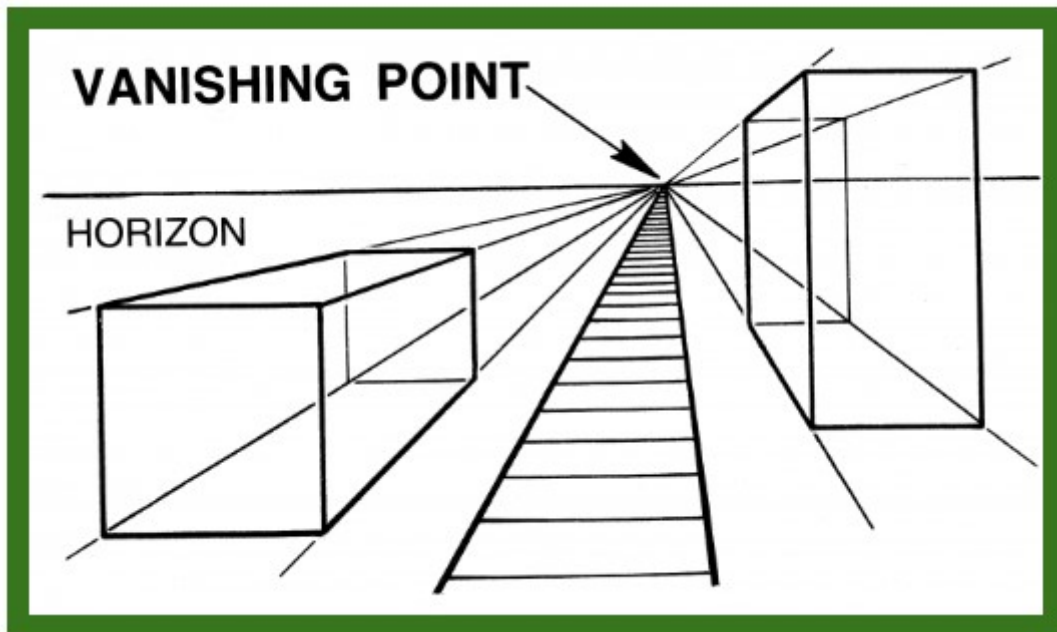
3 marks

The yellow in this image represents the hydraulic ... in the system.

Note: Your answer must be one word only.

--

This image refers to question: 8

**Question 8: Please Fill In The Blanks**

8 marks

This drawing uses a (1) vanishing point perspective drawing technique. This will help the designer to create a (2) drawing. The lines which are drawn from the object to the vanishing point are called (3) lines. This type of drawing is done during the (4) phase of the design process.

Possible Answers: design | construction | 3D | single | investigation | dimension | 2D | double

1	
3	

2	
4	

This image refers to question: 9, 10



Question 9: True/False

2 marks

This image shows a 3D sketch of a heavy earthmoving machine which uses a hydraulic system.

TRUE

FALSE

Question 10: Text Input

3 marks

This image shows an example of a machine which uses a/an ... system to lift, dig or move heavy loads.

Question 11: True/False

2 marks

Shading and shadows are added to a drawing to make it appear two-dimensional.

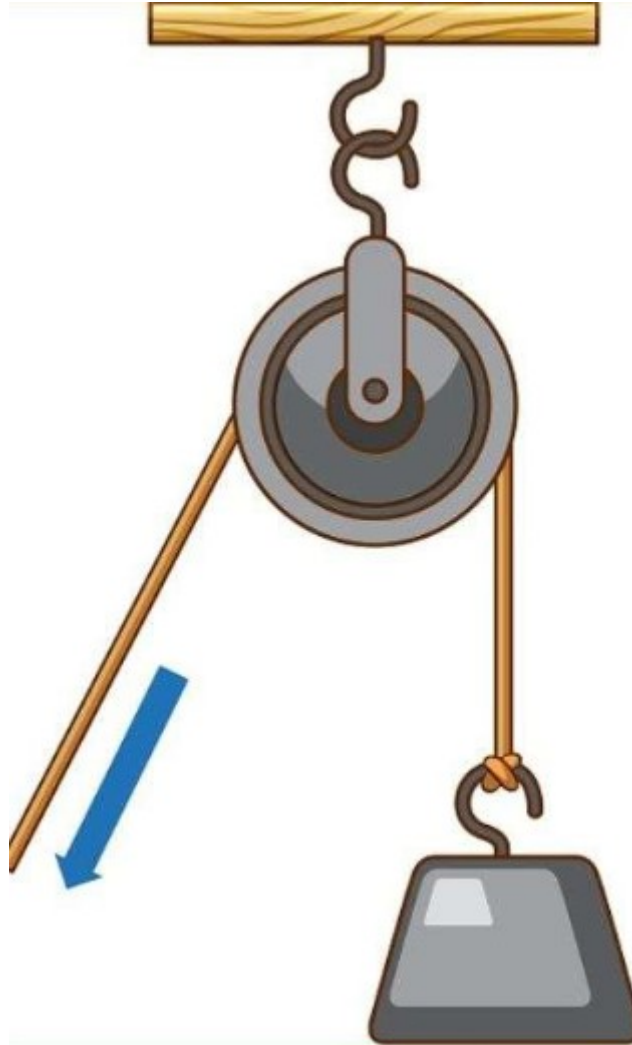
Question 12: Text Input

3 marks

What must be added to an orthographic projection to make it a working diagram?

Note: Your answer must be one word only.

This image refers to question: 13, 14



Question 13: Multiple Choice

4 marks

Which type of pulley is shown in this image?

- | | |
|----------|------------------------------|
| A | Single wheel moveable pulley |
| B | Block and tackle |
| C | Single wheel fixed pulley |
| D | Compound pulley |

Question 14: Please Fill In The Blanks

8 marks

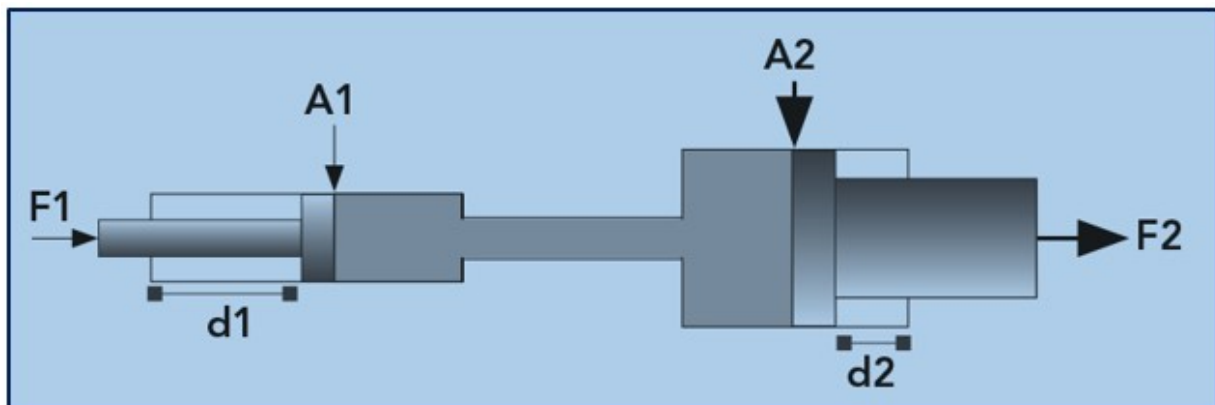
This is a single wheel (1) pulley. The (2) of the wheel is attached to a permanent point. This type of pulley will provide a mechanical advantage that is (3) 1. This pulley changes the (4) of the force applied.

Possible Answers: effort | greater than | equal to | direction | axle | fixed | less than | sheave | moveable

1	
3	

2	
4	

This image refers to question: 15, 16

**Question 15: Please Fill In The Blanks**

8 marks

To achieve force multiplication in a **hydraulic press**:

The (1) input force has to move through a (2) distance and the (3) output force moves through a (4) distance.

Possible Answers: wider | input | greater | thinner | smaller | output

1	
3	

2	
4	

Question 16: Multiple Choice

4 marks

This is a representation of a hydraulic press system:

- Select the correct value of the input force required (F_1) to provide the output force (F_2) of 375N. The input piston moves through distance of 300mm (d_1) and the output piston moves 10mm (d_2).
- The formula is $F_1 \times d_1 = F_2 \times d_2$

A	125N
B	112500N
C	1,25N
D	12,5N

Question 17: Please Fill In The Blanks

6 marks

Passenger train doors and bus doors make use of (1) systems to control the opening and closing of the doors. These doors are activated by a button being pushed which activates an electrical system. (2) is then drawn into the system and (3) which then controls the precise movement of the doors.

Possible Answers: air | oil | expanded | compressed | hydraulic | pneumatic

1	
3	

2	
----------	--

Question 18: Text Input

3 marks

What word refers to the size relationship given on a working drawing such as 1:10?

Note: Your answer must be one word only.

--

Question 19: Please Fill In The Blanks

8 marks

When drawing the **1st angle orthographic projection** a vertical cross shape is drawn in the middle of the page to create 4 blocks in which to draw.

The first view drawn is the (1) view which is drawn in the top left block. The side view is then constructed in the (2) block, and the (3) view is drawn below the front view. The (4) block is used only for construction lines.

Possible Answers: top | side | bottom | front | top right | bottom right | bottom left | top left

1	
3	

2	
4	

This image refers to question: 20



Question 20: Please Fill In The Blanks

6 marks

During the **design process**, you need to consider whether the product is comfortable and practical for a person to use. These are the (1) of the design. These take factors such as the size and (2) of the product into consideration.

The computer mouse in this image must fit into the user's hand and work with the body's natural (3) to minimise discomfort and injury. These same factors will be considered when designing the seat and steering wheel of an excavator.

Possible Answers: movements | aesthetics | cost | ergonomics | texture | comfort

1	
3	

2	
----------	--

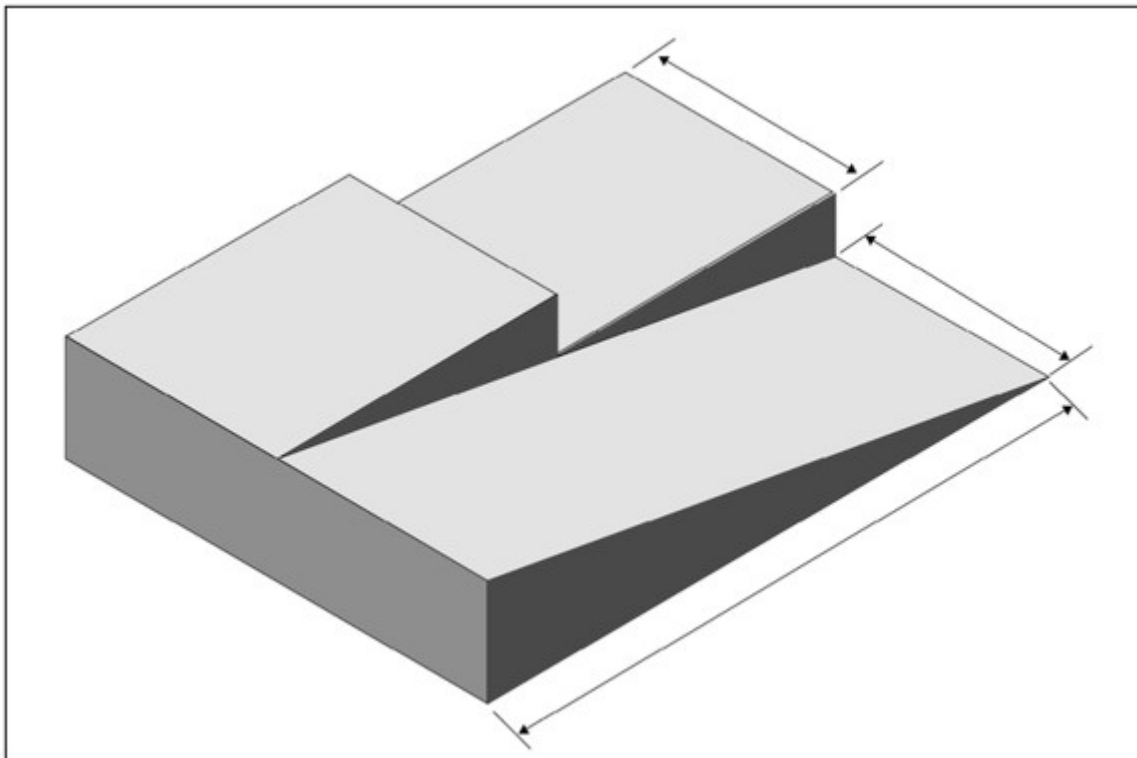
Question 21: Multiple Choice

4 marks

In a worm and wheel gear system, the worm gear is the...

- | | |
|----------|-------------|
| A | Output gear |
| B | Spur gear |
| C | Input gear |
| D | Idler gear |

This image refers to question: 22

**Question 22: Please Fill In The Blanks**

4 marks

When designing these steps it will be necessary to create a 2D (1) drawing of this ramp and staircase. If the steps are drawn in front of the ramp, then a (2) line will need to be drawn to show the position of the ramp.

Possible Answers: isometric | hidden detail | orthographic | centre

1		2	
----------	--	----------	--

Question 23: Text Input

3 marks

Once you receive a design brief stating the problem and specifications, what is the first step of the design process?

Note: Your answer must be one word only.

--

Question 24: Please Fill In The Blanks

8 marks

If the input gear is larger than the output gear this is called gearing (1) . The smaller driven gear will rotate (2) than the driver gear.

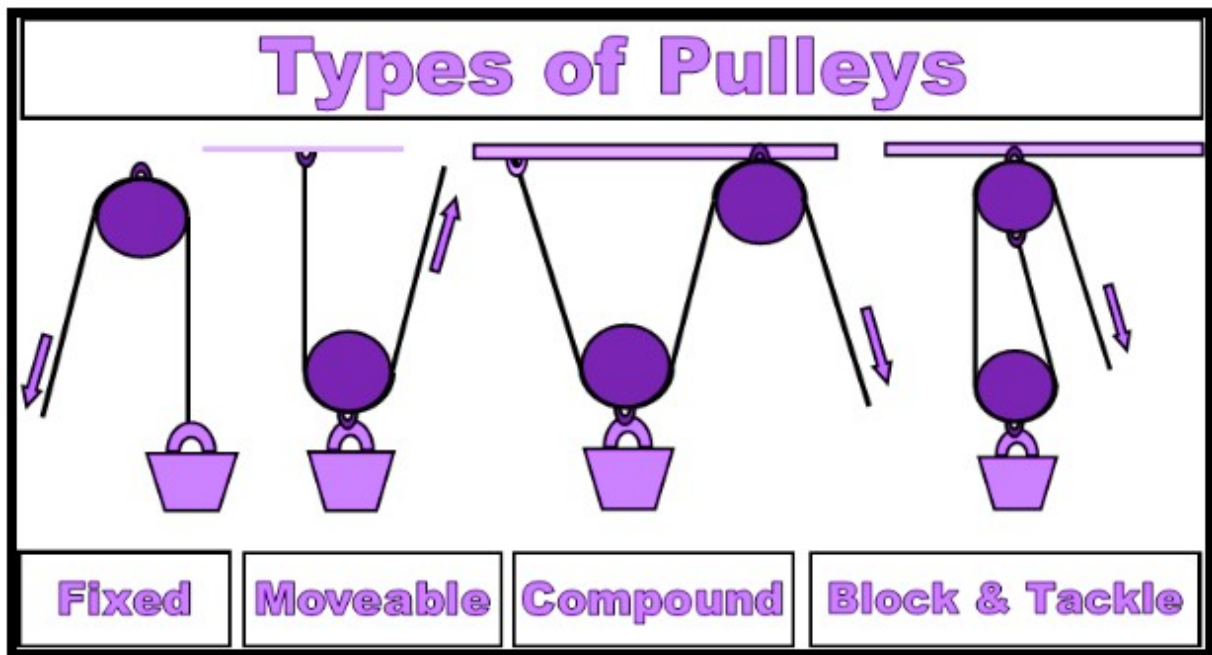
There is a (3) advantage. This reduces the (4) output by the smaller gear.

Possible Answers: slower | speed | faster | force | direction | up | down

1	
3	

2	
4	

This image refers to question: 25



Question 25: Text Input

3 marks

Select the type of pulley system which gives a mechanical advantage equal to one.

Note: Your answer must only be the word/s written in the box below the diagram of the selected pulley.

Question 26: Text Input

3 marks

Which unit of measurement is used on technical drawings?

- cm
- m
- mm

Question 27: Text Input

3 marks

What name is given to the 3D technical drawing of the staircase and ramp at 30°?

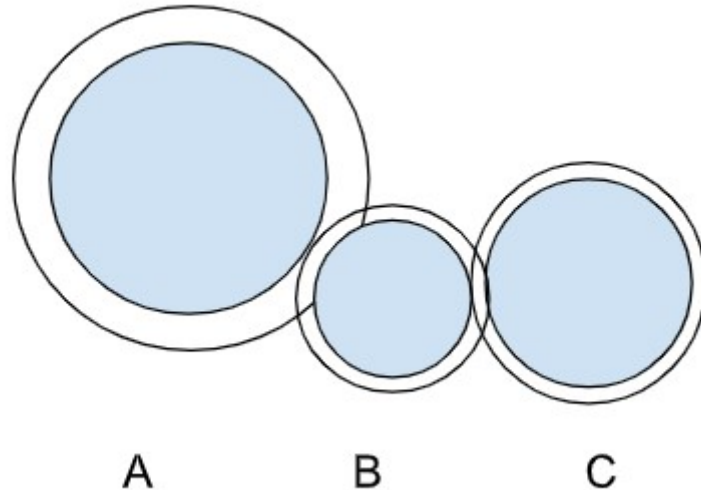
Your answer should be two words only.

Question 28: True/False

2 marks

"Bevel" and "worm" are both types of gears.

This image refers to question: 29, 30



Question 29: Multiple Choice

4 marks

There are three gears in a gear train.

The driver gear (**A**) has 60 teeth, the idler gear (**B**) has 20 teeth and the driven gear (**C**) has 30 teeth.

Calculate the **mechanical advantage**.

A	0,5
B	5
C	2
D	0,8

Question 30: Text Input

3 marks

What is the name given to the middle gear (B) in this spur gear train?

Note: Your answer must be one word only.

Total: 125 Marks