

**Calculators permitted but working must be shown.**

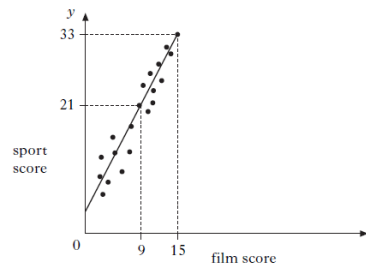
**Essential knowledge:**

- Calculate the gradient of each line AB, leaving your answer as a simplified fraction.

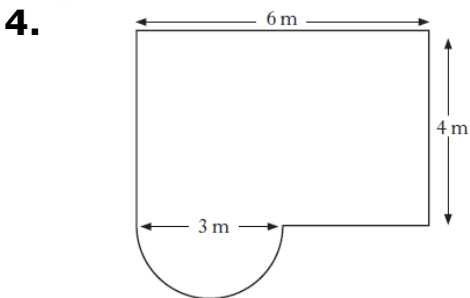


- The density of a substance is calculated by dividing its weight (grammes) by its volume (cubic centimetres). Find the density of:
  - An iron bar weighing 5000g with a volume of 635cm<sup>3</sup>
  - A lead bar weighing 2kg with a volume of 175cm<sup>3</sup>

- Teams in a quiz answer questions on films and sport. The scattergraph shows the scores of some of the teams. Calculate the gradient of the line of best fit.



**Unit level:**

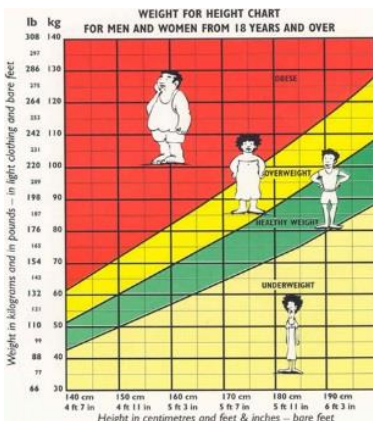


A patio is in the shape of a rectangle and a semi-circle. Copy and complete the line of working to calculate the area of the patio in m<sup>2</sup>.

~~6~~ × 2 + 1.5 × π × 4 = 27.53 m<sup>2</sup>

(6 × \_\_\_\_\_) + \_\_\_\_\_ × \_\_\_\_\_ ÷ \_\_\_\_\_ = \_\_\_\_\_ m<sup>2</sup>

- Your Body Mass Index (BMI) is found by dividing your weight in kilogrammes by the square of your height in metres.



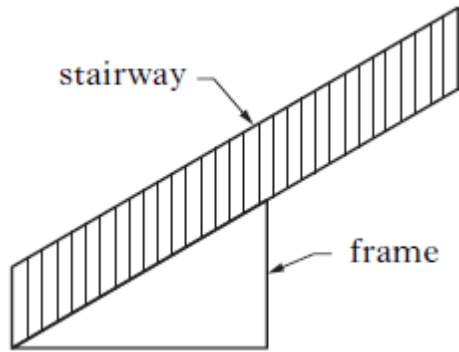
- Calculate John's BMI if he weighs 105kg and is 1.78m tall.
- Jane has a BMI of 25. If she is 150cm tall, how heavy is she?
- People with a BMI of higher than 30 are "obese". How much weight does John need to lose to get out of the obese group?

gradient =  $\frac{\text{vertical height}}{\text{horizontal distance}}$

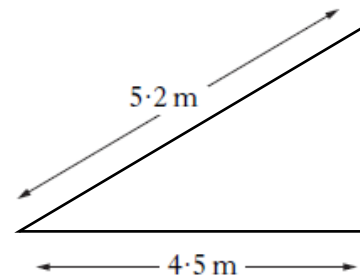
Body Mass Index =  $\frac{\text{weight}}{\text{height}^2}$

Density =  $\frac{\text{weight}}{\text{volume}}$

6. Ahmed is making a frame to fit his stairway:



The hypotenuse of the frame is 5.2m and the horizontal distance is 4.5m



Find the **gradient** of the staircase

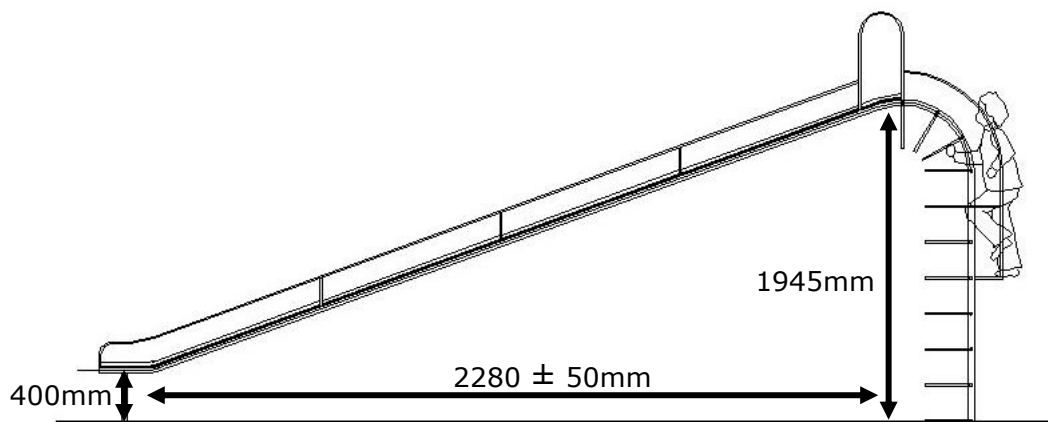
7. What classification would be given to the ski run shown?

### Classification of skiing slopes

- Green circle - Beginner slope**  
 Wide & groomed, gradient ranging from 6% to 25% (100% slope is a 45 degrees angle)
- Blue square - intermediate slopes**  
 Gradient 25% to 40% and usually groomed.
- Black diamond - Advance slope**  
 Gradient 40% and above, usually not groomed

**Assessment level:**

8. The dimensions of a playground slide are shown below.



What is the **largest** possible gradient of the slide?

$$\text{gradient} = \frac{\text{vertical height}}{\text{horizontal distance}}$$

$$\text{Body Mass Index} = \frac{\text{weight}}{\text{height}^2}$$

$$\text{Density} = \frac{\text{weight}}{\text{volume}}$$