Formulae & Gradient

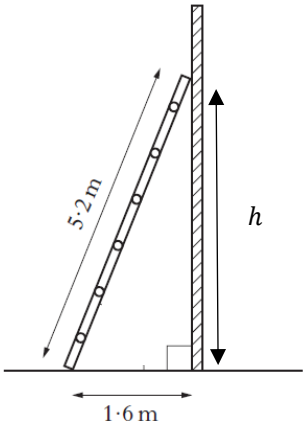
N5 Applications G&M

Calculators permitted but working must be shown.

Essential knowledge:

1. Regulations state that a leaning ladder should be set at a gradient of 4

(a) Calculate the vertical height, h, the ladder shown reaches up the wall.



(b) Does this ladder satisfy the regulations? You must justify your answer.

2. The density of a substance is calculated by dividing its weight (grammes) by its volume (cubic centimetres). Find the density of:

(a) An iron bar weighing 5000g with a volume of 635cm^3

(b) A lead bar weighing 2kg with a volume of 175cm^3

3. Richard is cooking a 3 kg chicken for a dinner party. The formula for calculating the cooking time is:

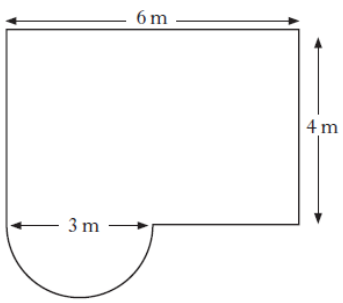
$T = 25w + 30$ where $w = weight\ in\ kg$ and $T = time\ in\ minutes$

(a) How long, in hours and minutes, will it take for the chicken to cook?

(b) The chicken must be cooked by 1515 hours. At what time should Richard put the chicken in the oven?

Unit level:

4.



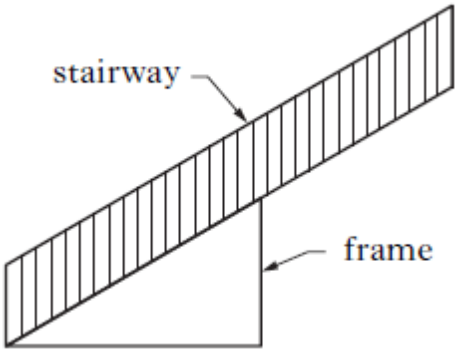
A patio is in the shape of a rectangle and a semi-circle. Copy and complete the line of working to calculate the area of the patio in m^2.

~~6~~ 2 1.5 π 4 27.53 ^{2}

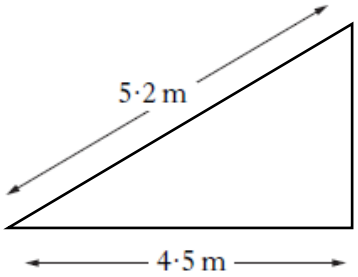
(6 x _____) + ___ x _____ _____ ÷ _____ = ___ m^2

$gradient = \frac{vertical\ height}{horizontal\ distance}$ $Pythagoras: \quad c^2 = a^2 + b^2$

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

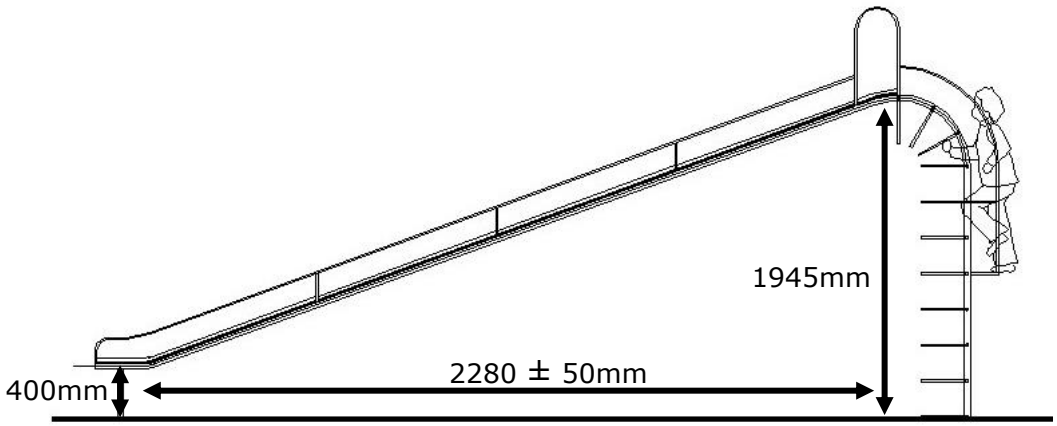


The hypotenuse of the frame is 5.2m and the horizontal distance is 4.5m



Find the **gradient** of the staircase

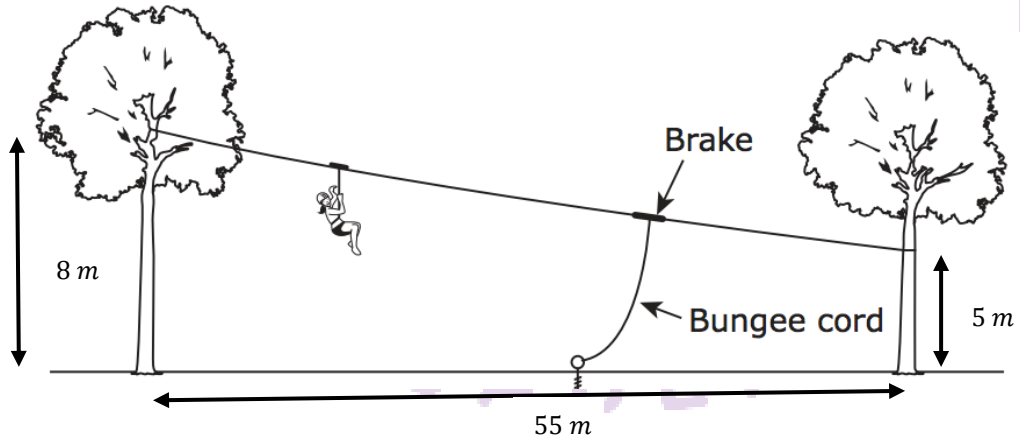
6. The dimensions of a playground slide are shown below.



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

Assessment level:

7. Safety regulations for a zip line recommend that the gradient is no more than 3% for a line without a brake and no more than 6% for a line that has a brake.



Does the above zip line satisfy these regulations?
You must justify your answer.

$gradient = \frac{vertical\ height}{horizontal\ distance}$ $\quad$ $Pythagoras: \quad c^2 = a^2 + b^2$