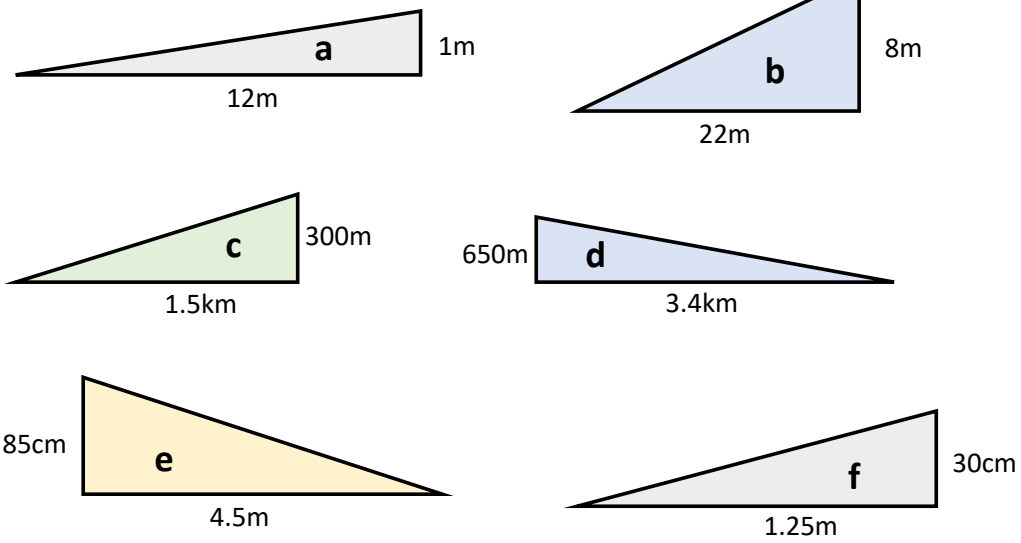
Gradient:

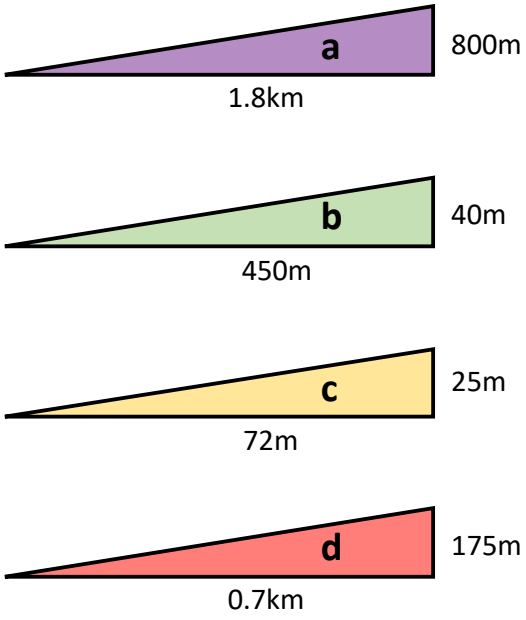
1. Calculate the gradient of each of the following slopes. Write your answer as a fraction in its simplest form **and** a decimal.



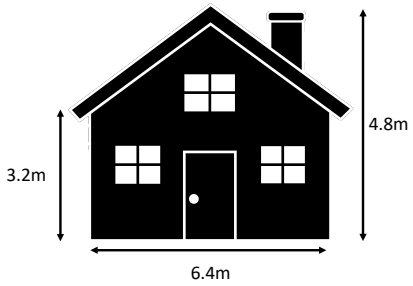
2. Ski slopes come in a variety of steepness depending on different levels of skill. Slopes are classed using the following criteria.

Beginner	<0.25
Intermediate	Between 0.25 and 0.4
Advanced	>0.4

Work out what the gradient and the level of skill that is required for each of the following slopes.

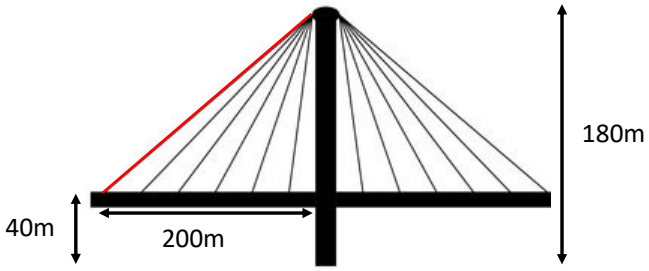


3. A drawing of a house is shown below.



Calculate the gradient of roof.

4. A bridge connecting two cities is shown below. The bridge had cables as shown that go from the road to the top of a pillar.



Calculate the gradient of the highlighted cable.

5. Garth decides to cycle up a hill.

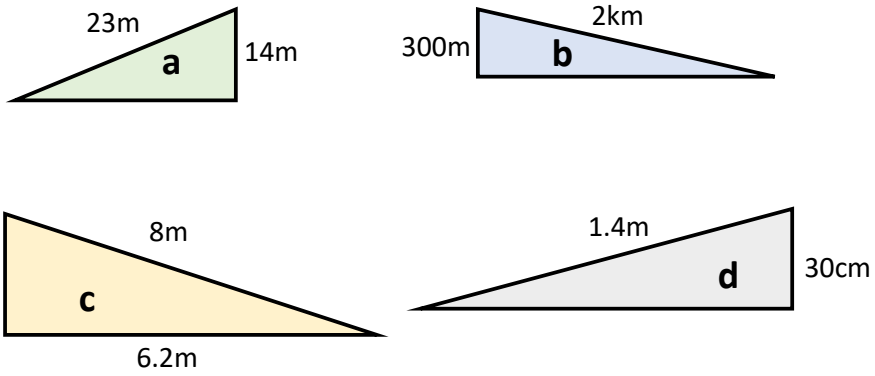
- The horizontal distance between the start point and the finish point is 4km.
- The start point is 50 metres above sea level.
- The finish point is 400 metres above sea level.

a) Calculate the average gradient between the start point and the finish point. Give you answer as a fraction **in its simplest form**.

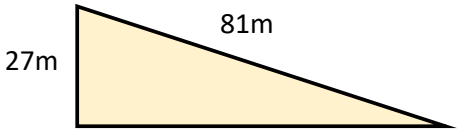
b) One part of the road has gradient $\frac{3}{25}$, is this steeper than the average gradient?

Gradient and Pythagoras

1. For each of the following slope calculate the missing side and then the gradient.



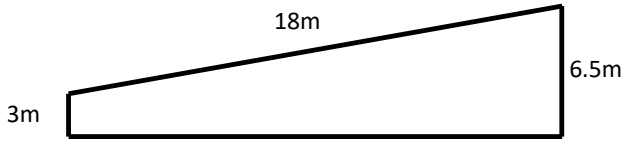
2. A new ski slope is built as follows



State which skill level this slope is suited for using the table below.

Beginner	<0.25
Intermediate	Between 0.25 and 0.4
Advanced	>0.4

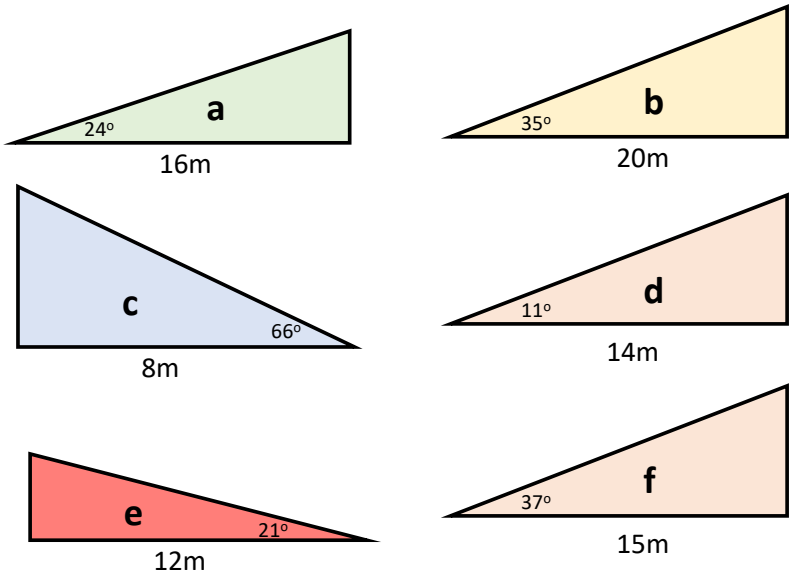
3. A zip line is positioned as shown below.



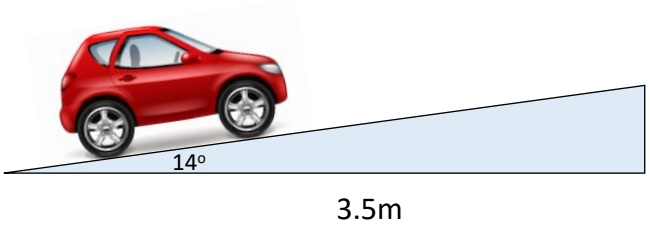
For the zip line to be considered safe, the gradient of the 18m zip line must be between 0.2 and 0.4. Is this zip line safe?

Gradient and Scale Drawing

1. For each of the following,
i) Make a scale drawing **using the scale 1cm = 2m**,
ii) Calculate the vertical height of each slope, and hence
iii) Calculate the gradient for each of the following.

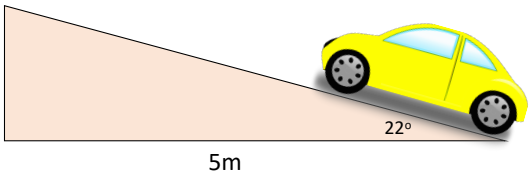


2. Diane's driveway is sloped as shown in the diagram below.
The cross-section of the driveway is in the shape of a right-angled triangle.
The base is 3.5m long and makes an angle of 14° with the driveway as shown in the diagram below.



a) Construct a scale drawing of the cross-section of the driveway. Use the scale of 1cm = 0.5m
b) Use your scale drawing to calculate the gradient of the driveway.

3. Henry's driveway is sloped as shown in the diagram below.
The cross-section of the driveway is in the shape of a right-angled triangle.
The base is 5m long and makes an angle of 22° with the driveway as shown in the diagram below.



a) Construct a scale drawing of the cross-section of the driveway. Use the scale of 1cm = 0.5m
b) Use your scale drawing to calculate the gradient of the driveway.