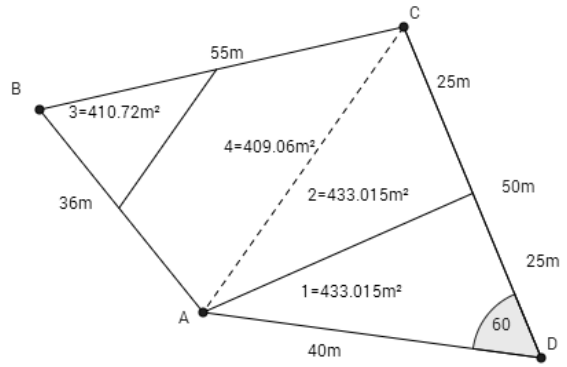
Student 1: Low Excellence

NZQA Intended for teacher use only



Length of pipeline =

$a^2 = 40^2 + 50^2 - 2 \times 40 \times 50 \times \cos 60$

$a^2 = 2100$

$a = 45.83m$

area $\triangle ACD = \frac{1}{2}bc\sin A = \frac{1}{2} \times 40 \times 50 \times \sin 60 = 866.03m^2 (3sf)$

$\angle ABC = \frac{36^2 + 55^2 - 45.83^2}{2 \times 36 \times 55} = 0.56$

$\cos^{-1} 0.56 = 55.9^o = \angle ABC$

Area $\triangle ABC = \frac{1}{2}bc\sin A = \frac{1}{2} \times 36 \times 55 \times \sin 55.9 = 819.78m^2$

Total area is 819.78+866.03 = 1685.81m^2

$1685.81 \div 4 = 421.4$ so it can be divided into 4 sections of at least 400m^2. (1)

$\triangle ACD$ half the base of CD to get two triangles with half the area of ACD.

Subsection 1= $\frac{1}{2} \times 25 \times 40 \times \sin 60$ which is 433.015m^2. This means

Subsection 2 is also 433.015m^2 because 866.03-433.015=433.015

Subsection 3 = $\frac{1}{2} \times 31 \times 32 \times \sin 55.9$ which is 410.72m^2 which means

Subsection 4 is 819.78-410.72 = 409.06m^2.

There is 4 subsections with at least 400m^2 in each one and they are not all triangles. (2)