Section 2

B

56

55m

C

pipe line

36m

45.8m

Section 1

50m

A

40m

60

D

$$a^2 = b^2 + c^2 - 2bc\cos A$$
$$a^2 = 50^2 + 40^2 - 2 \times 50 \times 40 \times \cos 60$$
$$a^2 = 2100$$
$$a = 45.8m (3sf)$$

Area Section 1
$$= \frac{1}{2}bc\sin A = \frac{1}{2} \times 40 \times 50 \times \sin 60 = 866m^2 (3sf)$$

①

$$\angle B = \cos A = \frac{b^2 + c^2 - a^2}{2bc}$$
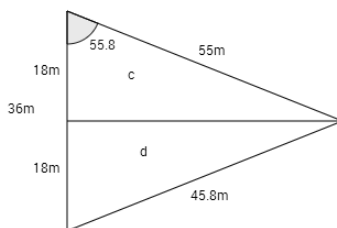$$= \frac{55^2 + 36^2 - 45.8^2}{2 \times 55 \times 36}$$
$$A = 55.8 (3sf)$$

Area Section 2
$$= \frac{1}{2}bc\sin A = \frac{1}{2} \times 36 \times 55 \times \sin 55.8 = 818.8m^2 (1dp)$$

①

Section 2

55.8

55m

18m

c

36m

d

18m

45.8m

$$a^2 = b^2 + c^2 - 2bc\cos A$$
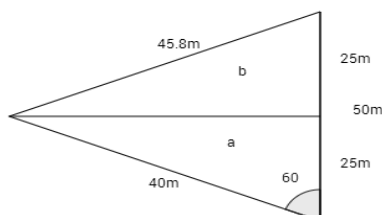$$a^2 = 18^2 + 55^2 - 2 \times 18 \times 55 \times \cos 55.8$$
$$a^2 = 7736$$
$$a = 47.3m$$
$$areac = \frac{1}{2}ab\sin C = \frac{1}{2} \times 18 \times 55 \times \sin 55.8 = 409.4m^2 (1dp)$$

②

$$aread = 818.8 - 409.4 = 409.4m^2$$

Section 1

45.8m

b

25m

50m

a

25m

40m

60

$$a^2 = b^2 + c^2 - 2bc\cos A$$
$$a^2 = 25^2 + 40^2 - 2 \times 25 \times 40 \times \cos 60$$
$$a^2 = 1225$$
$$a = 35m$$
$$areaa = \frac{1}{2}ab\sin C = \frac{1}{2} \times 25 \times 40 \times \sin 60 = 433m^2$$

②

$$areab = 866 - 433 = 433m^2$$

If you split section 1 between CD and join up with A and section 2 between AB and join up with C you can create 4 sections all over 400m^2.

②