Achieved Trigonometry Practice #3
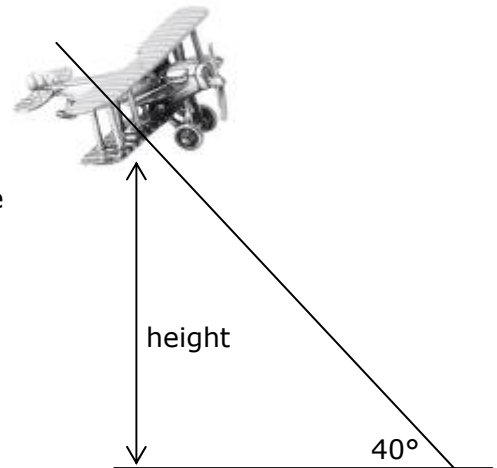
1. A man sees a plane flying at a height of 1200 metres. The angle from the ground is 40°.

    How far is it along the ground is it from the man to the point directly below the plane?

    height

    40°

2. The plane climbs to 2000 metres high and is 3000 metres away along the ground from the watcher.
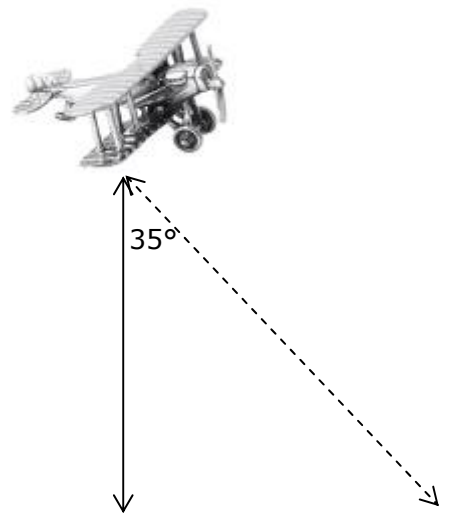
    a)   What angle does he now see it at?

    b)   How far away is it?

3. The pilot circles around again until his height is now 1000 metres.

    35°

    He sees the man at the ground at angle of 35° from directly downwards.

    How far is it in a direct line from the plane to the man?
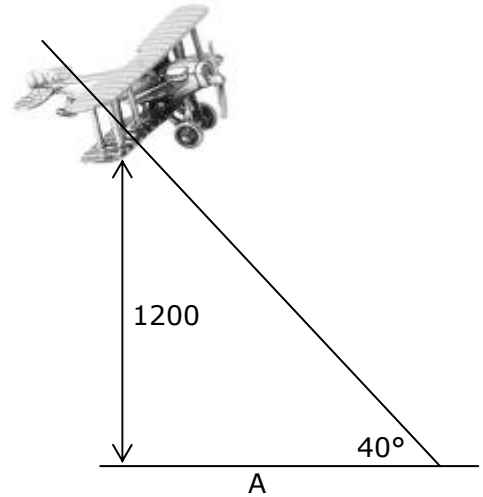
Answers: Achieved Trigonometry Practice #3

1. A man sees a plane flying at a height of 1200 metres. The angle from the ground is 40°.

   How far is it along the ground is it from the man to the point directly below the plane?

   There is an angle, so we use $S\frac{O}{H}$ $C\frac{A}{H}$ $T\frac{O}{A}$.

   We have the O and want the A, so we use $T\frac{O}{A}$.

   A = O ÷ T = 1200 ÷ Tan 40 = **1430 m**

   1200

   40°

   A
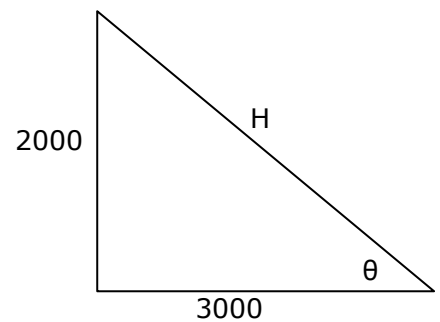
2. The plane climbs to 2000 metres high and is 3000 metres away along the ground from the watcher.

   a) What angle does he now see it at?

   There is an angle, so we use $S\frac{O}{H}$ $C\frac{A}{H}$ $T\frac{O}{A}$.

   We have the A and O, so we use $T\frac{O}{A}$.

   θ = Tan^{-1} (O ÷ A) = Tan^{-1} (2000 ÷ 3000) = **33.69°**

   2000

   H

   3000

   θ

   b) How far away is it?

   Long side, so we use: $h^2 = a^2 + b^2$

   $h^2 = 2000^2 + 3000^2 = 13,000,000.$

   $h = \sqrt{13000000}$ = **3606 m**

3. The pilot circles around again until his height is now 1000 metres.

   He sees the man at the ground at angle of 35° from directly downwards.

   How far is it in a direct line from the plane to the man?

   There is an angle, so we use $S\frac{O}{H}$ $C\frac{A}{H}$ $T\frac{O}{A}$.

   We have the A and want the H, so we use $C\frac{A}{H}$.

   H = A ÷ C = 1000 ÷ Cos 35 = **1221 m**

   35°

   H

   1000

MAN vs MATHS 2014