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| **S3 Mathematics Homework Exercise 1** | | | | | | | | | | C:\Users\Ian\Pictures\CHS.jpg | | |
|  | | | | | | | | | |
| **Trigonometry** | | | | | | | | | |
|  | | | | | | | | | | | | |
| Issued by: | | | |  | | | Return by: | | |  | | |
|  | | | | | | | | | | | | |
| **Working MUST be shown in every answer.** | | | | | | | | | | | | |
|  | | | | | | | | | | | | |
| **1.** | Find *x* in each triangle below, accurate to 1 d.p. | | | | | | | | | | | |
|  |  | |  | | | | | | | | | |
|  | a) | 50cm  *x*  35° | | | b) | 17°  8cm  *x* cm | | | | | c) | 53mm  67 mm  *x* ° |
|  | d) | *x*  22°  4.75m | | | e) | *x* cm  63.5°  8cm | | | | |  |  |
|  |  | | | | | | | | | | | |
| **2.** | An engineer calculates the height of a building by measuring the angle of elevation to the top of the roof from a distance of 20 metres. | | | | | | | | 20m  34° | | | |
|  |  | | | | | | | |
|  | She finds that the angle of elevation is 34°. | | | | | | | |
|  |  | | | | | | | |
|  | Find the height of the building accurate to 3 s.f. | | | | | | | |
|  |  | | | | | |  | | | | | |
| **3.** | A window cleaner has a 4.5m long ladder. Health & Safety regulations state that the maximum angle the ladder can make with the ground is 65°. What is the maximum safe height the window cleaner can reach from the ground? (**HINT:** draw a diagram!) | | | | | | | | | | | |
|  |  | | | | | |  | | | | | |
| **4.** | 16 cm  12  cm  *x* ° | | | | | | The diagonals of this rhombus are 16cm and 12cm long.  Find the size of angle *x*.  HINT: the diagonals of a rhombus bisect each other at 90° | | | | | |
|  |  | | | | | | | | | | | |
| **5.** | A car port is constructed from sections like those in the diagram.  To the nearest degree, find the angle the roof makes with the ground. | | | | | | | 4.5m  10m  2.5m | | | | |

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| **Q.** | **Award 1 Mark for each ●:** | | | | | | | | | |
|  |  | | | | | | | | | |
| 1. | a) | ● cosine | | b) | ● sine | | | | c) | ● sine |
|  |  | ● x = 50 cos 35° | |  | ● x = 8/sin 17° | | | |  | ● sin x = 53/67 |
|  |  | ● x = 40.9576……. | |  | ● x = 27.3624…… | | | |  | ● x = sin-1 (53/67) |
|  |  | ● x = 41.0 (m) | |  | ● 27.4 (cm) | | | |  | ● x = 52.2832….. |
|  |  |  | |  |  | | | |  | ● x = 52.3° |
|  |  |  | |  |  | | | |  |  |
|  | d) | ● cosine | | e) | ● tangent | | | |  |  |
|  |  | ● x = 4.75/cos 22° | |  | ● x = 8/ tan 63.5° | | | |  |  |
|  |  | ● x = 5.1230…… | |  | ● x = 3.9886….. | | | |  |  |
|  |  | ● x = 5.1 (m) | |  | ● x = 4.0 (cm) | | | |  |  |
|  |  | | | | | | | | | |
| 2. | ● tangent | | | | | | | | | |
|  | ● x = 20tan 34° | | | | | | | | | |
|  | ● x = 13.4901….. | | | | | | | | | |
|  | ● x = 13.5m (to 3 sf) | | | | | | | | | |
|  |  | | | | | 65°  x  4.5m | | | | |
| 3. | ● diagram shown (see opposite) | | | | |
|  | ● sine | | | | |
|  | ● x = 4.5 sin 65° | | | | |
|  | ● 4.1m | | | | |
|  |  | | | | |
|  |  | | | | | | | | | |
| 4. | ● right-angled triangle generated (see opposite) | | | | | | | 8cm  6cm | | |
|  | ● tangent | | | | | | |
|  | ● y = tan -1 (6/8) (treat x = tan -1 (6/8) as bad form) | | | | | | |
|  | ● y = 36.8698…. | | | | | | |
|  | ● x = 2 x 36.8698…. (stated or implied) | | | | | | |
|  | ● x = 73.7° | | (accept 74° ONLY if rounding has not already happened prior to this stage) | | | | |
|  |  | | | | | | | | | |
| 5. | ● right-angled triangle generated (see opposite) | | | | | | 10m  2m | | | |
|  | ● tangent | | | | | |
|  | ● x = tan-1 (2/10) | | | | | |
|  | ● x = 11.3099….. | | | | | |
|  | ● x = 11° | | | | | |
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| Total: 40 marks | | | | | | | | | | |