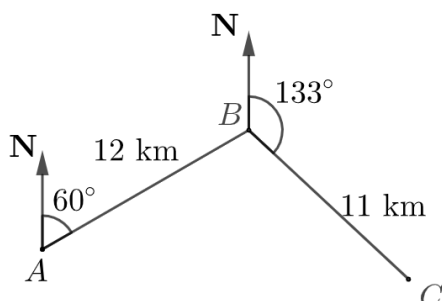Question 1

The diagram shows the position of three towns, A, B, and C.
Find the bearing of C from A to the nearest degree.
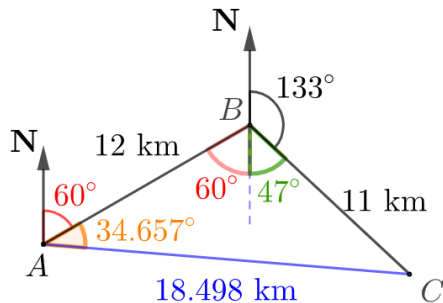

Question 2

$$f(x) = \frac{3\,x}{x - 7} \text{ and } g(x) = x^6 + 7$$

Find $fg(x)$, giving your answer in the form $ax^n + b$
where $a, b,$ and n are integers.

Question 1

The diagram shows the position of three towns, A, B, and C.
Find the bearing of C from A to the nearest degree.

$\angle ABC = 60° + 47° = 107°$

Using the cosine rule, we find length $AC = 18.498$ km

Using the sine rule, we find $\angle CAB = 35°$ to the nearest degree.

The bearing of C from A is therefore $60° + 35° = 095°$

Question 2

$f(x) = \dfrac{3\,x}{x - 7}$ and $g(x) = x^6 + 7$

Find $fg(x)$, giving your answer in the form $ax^n + b$
where $a, b,$ and n are integers.

$fg(x) = \dfrac{3(x^6 + 7)}{(x^6 + 7) - 7}$

$= \dfrac{3\left(x^6 + 7\right)}{x^6}$

$= \dfrac{3\,x^6}{x^6} + \dfrac{21}{x^6}$

$= 3 + 21x^{-6}$