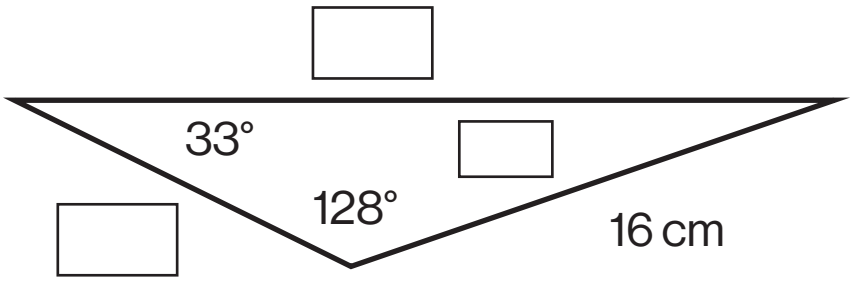
Oblique Triangles Practice

Name: _____ Date: _____

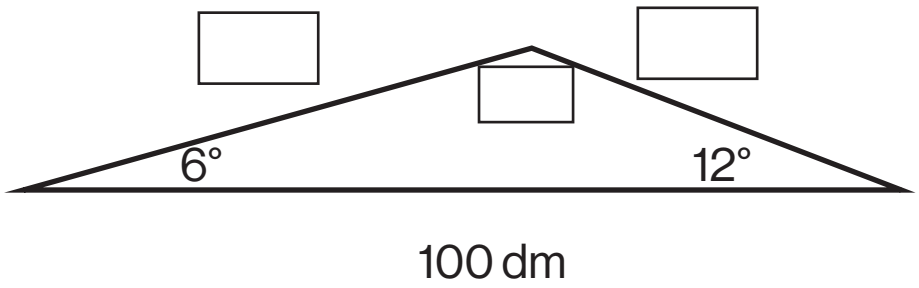
Question 1

Determine the unknown values (round to the nearest tenth)

I.



II.



Question 2

Based on the data, determine if the information belongs to one triangle, two triangles, or no triangle. Then, solve for the unknown values if possible (round to the nearest whole number)

I. $A = 40°$ $a = 54$ yd $b = 62$ yd

Oblique Triangles Practice

ll. $A = 75°$ $a = 52$ yd $b = 72$ yd

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III. $A = 43°$ $a = 81\,\text{yd}$ $b = 62\,\text{yd}$

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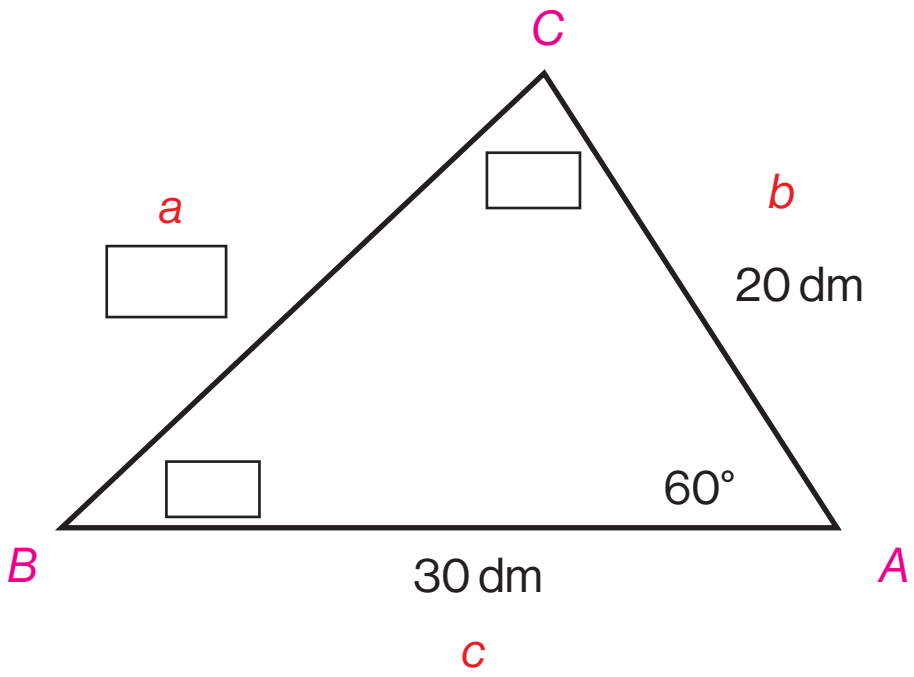
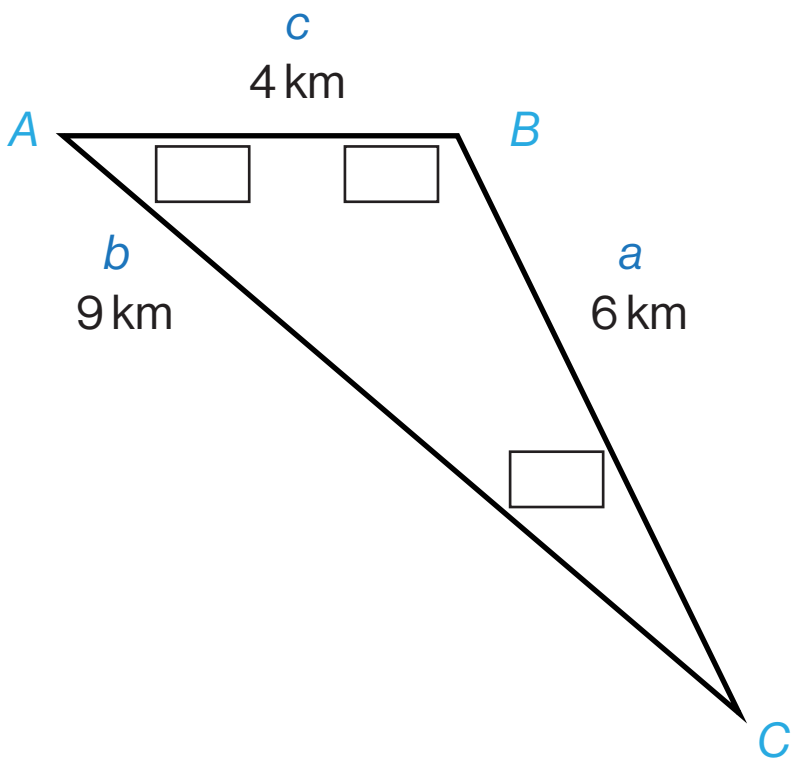
Question 3

Determine the unknown values (round to the nearest tenth)

I.



II.



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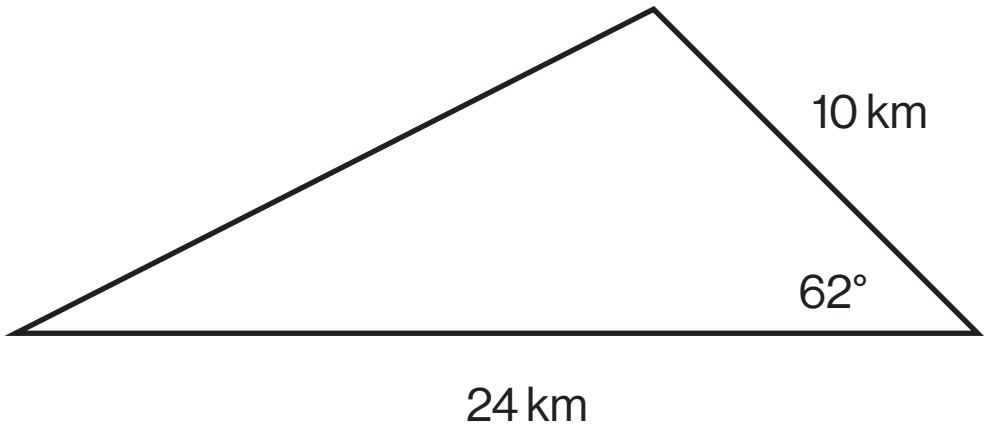
Question 4

Determine the area of the triangle (round to the nearest whole number)



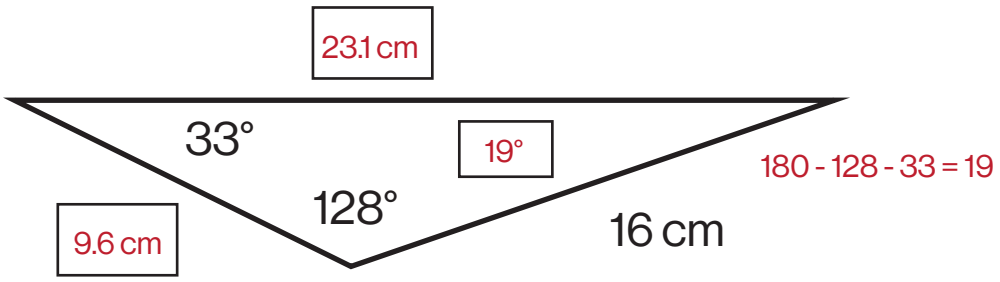
Oblique Triangles Practice

Name: **Key** Date: _____

Question 1

Determine the unknown values (round to the nearest tenth)

I.



180 - 128 - 33 = 19

$$\frac{x}{\sin(128°)} = \frac{16}{\sin(33°)}$$

$$x \cdot \sin(33°) = 16 \cdot \sin(128°)$$

$$x = \frac{16 \cdot \sin(128°)}{\sin(33°)}$$

$$23.1 \approx \frac{16 \cdot \sin(128°)}{\sin(33°)}$$

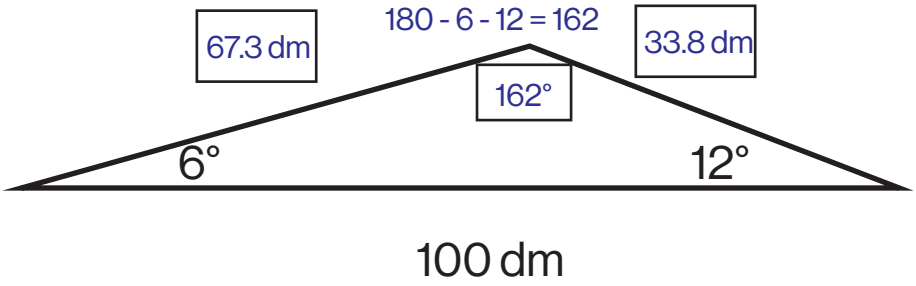
$$\frac{x}{\sin(19°)} = \frac{16}{\sin(33°)}$$

$$x \cdot \sin(33°) = 16 \cdot \sin(19°)$$

$$x = \frac{16 \cdot \sin(19°)}{\sin(33°)}$$

$$9.6 \approx \frac{16 \cdot \sin(128°)}{\sin(33°)}$$

II.



$$\frac{x}{\sin(6°)} = \frac{100}{\sin(162°)}$$

$$x \cdot \sin(162°) = 100 \cdot \sin(6°)$$

$$x = \frac{100 \cdot \sin(6°)}{\sin(162°)}$$

$$33.8 \approx \frac{100 \cdot \sin(6°)}{\sin(162°)}$$

$$\frac{x}{\sin(12°)} = \frac{100}{\sin(162°)}$$

$$x \cdot \sin(162°) = 100 \cdot \sin(12°)$$

$$x = \frac{100 \cdot \sin(12°)}{\sin(162°)}$$

$$67.3 \approx \frac{100 \cdot \sin(12°)}{\sin(162°)}$$

Question 2

Based on the data, determine if the information belongs to one triangle, two triangles, or no triangle. Then, solve for the unknown values if possible (round to the nearest whole number)

I. $A = 40°$ $a = 54$ yd $b = 62$ yd

$$\frac{62}{\sin(B°)} = \frac{54}{\sin(40°)}$$

$$54 \cdot \sin(B°) = 62 \cdot \sin(40°)$$

$$\sin(B°) = \frac{62 \cdot \sin(40°)}{54}$$

$$(B°) = \sin^{-1}\left(\frac{62 \cdot \sin(40°)}{54}\right)$$

$$(48°) \approx \sin^{-1}\left(\frac{62 \cdot \sin(40°)}{54}\right)$$

180° Check:

$B1: 48°$ $B2: 180° - 48° = 132°$

$A + B1: 40° + 48° = 88 < 180$ ✓

$A + B2: 40° + 132° = 172 < 180$ ✓

both pass = two possible triangles

Remaining Triangle:

$C1: 92°$ $C2: 8°$

$$\frac{c1}{\sin(92°)} = \frac{54}{\sin(40°)}$$

$$c1 \cdot \sin(40°) = 54 \cdot \sin(92°)$$

$$c1 = \frac{54 \cdot \sin(92°)}{\sin(40°)}$$

$$84 \approx \frac{54 \cdot \sin(92°)}{\sin(40°)}$$

$$\frac{c2}{\sin(8°)} = \frac{54}{\sin(40°)}$$

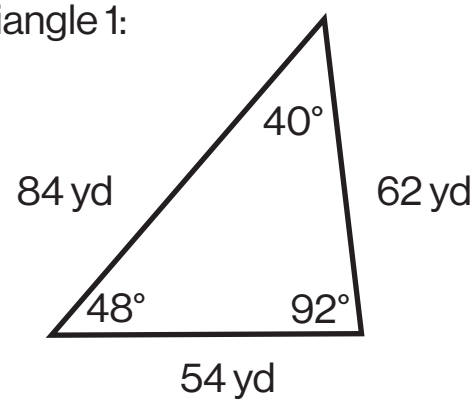
$$c2 \cdot \sin(40°) = 54 \cdot \sin(8°)$$

$$c2 = \frac{54 \cdot \sin(8°)}{\sin(40°)}$$

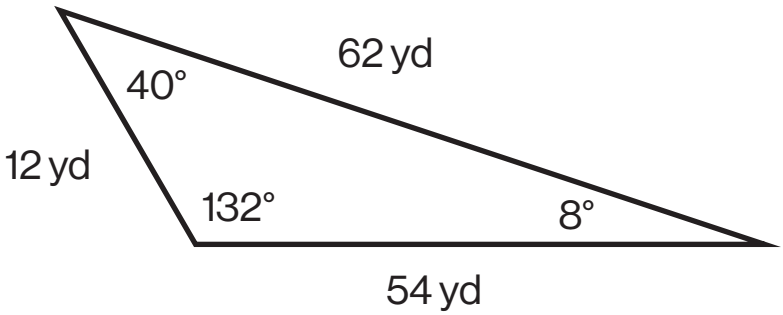
$$12 \approx \frac{54 \cdot \sin(8°)}{\sin(40°)}$$

Oblique Triangles Practice

Triangle 1:



Triangle 2:



II. $A = 75°$ $a = 52$ yd $b = 72$ yd

$$\frac{72}{\sin(B°)} = \frac{52}{\sin(75°)}$$

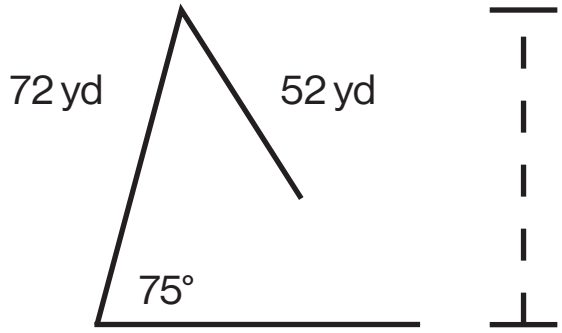
$$52 \cdot \sin(B°) = 72 \cdot \sin(75°)$$

$$\sin(B°) = \frac{72 \cdot \sin(75°)}{52}$$

$$(B°) = \sin^{-1}\left(\frac{72 \cdot \sin(75°)}{52}\right)$$

$$\text{N/A} = \sin^{-1}\left(\frac{72 \cdot \sin(75°)}{52}\right)$$

height check:



$72 \sin(75°) \approx 70$

52 yd (*a*) < 70 yd (*height*)

Not a triangle

Oblique Triangles Practice

III. $A = 43°$ $a = 81\,\text{yd}$ $b = 62\,\text{yd}$

$$\frac{62}{\sin(B°)} = \frac{81}{\sin(43°)}$$

$$81 \cdot \sin(B°) = 62 \cdot \sin(43°)$$

$$\sin(B°) = \frac{62 \cdot \sin(43°)}{81}$$

$$(B°) = \sin^{-1}\left(\frac{62 \cdot \sin(43°)}{81}\right)$$

$$(31°) \approx \sin^{-1}\left(\frac{62 \cdot \sin(43°)}{81}\right)$$

180° Check:

$B1: 31°$ $B2: 180° - 31° = 149°$

$A + B1: 43° + 31° = 74 < 180$ ✓

$A + B2: 43° + 149° = 192 > 180$ ✗

one pass = one possible triangle

Remaining Triangle:

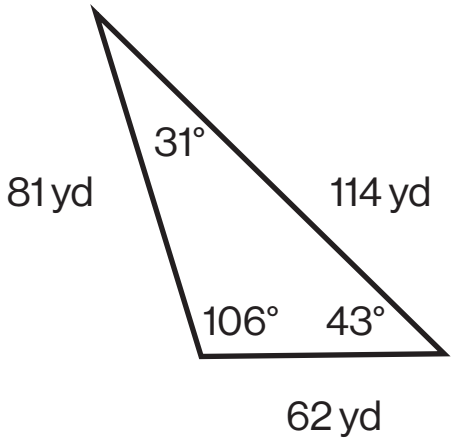
$C: 106°$

$$\frac{c}{\sin(106°)} = \frac{81}{\sin(43°)}$$

$$c \cdot \sin(43°) = 81 \cdot \sin(106°)$$

$$c = \frac{81 \cdot \sin(106°)}{\sin(43°)}$$

$$114 \approx \frac{81 \cdot \sin(106°)}{\sin(43°)}$$



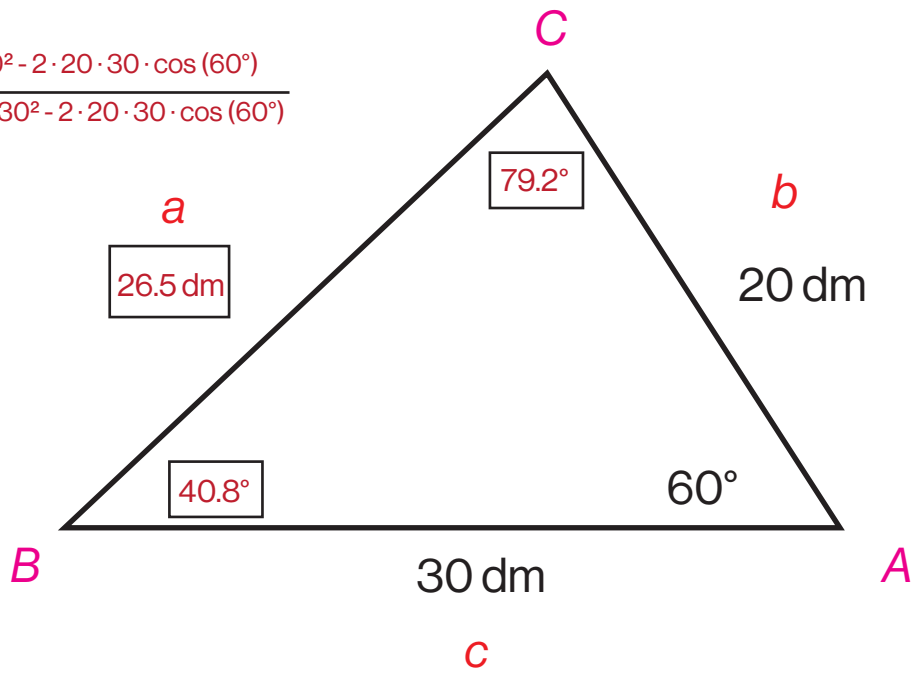
Oblique Triangles Practice

Question 3

Determine the unknown values (round to the nearest tenth)

I.

$180 - 60 - 40.8 = 79.2$



$a^2 = 20^2 + 30^2 - 2 \cdot 20 \cdot 30 \cdot \cos(60°)$

$a = \sqrt{20^2 + 30^2 - 2 \cdot 20 \cdot 30 \cdot \cos(60°)}$

$a \approx 26.5$

$$\frac{20}{\sin(B°)} = \frac{26.5}{\sin(60°)}$$

$26.5 \cdot \sin(B°) = 20 \cdot \sin(60°)$

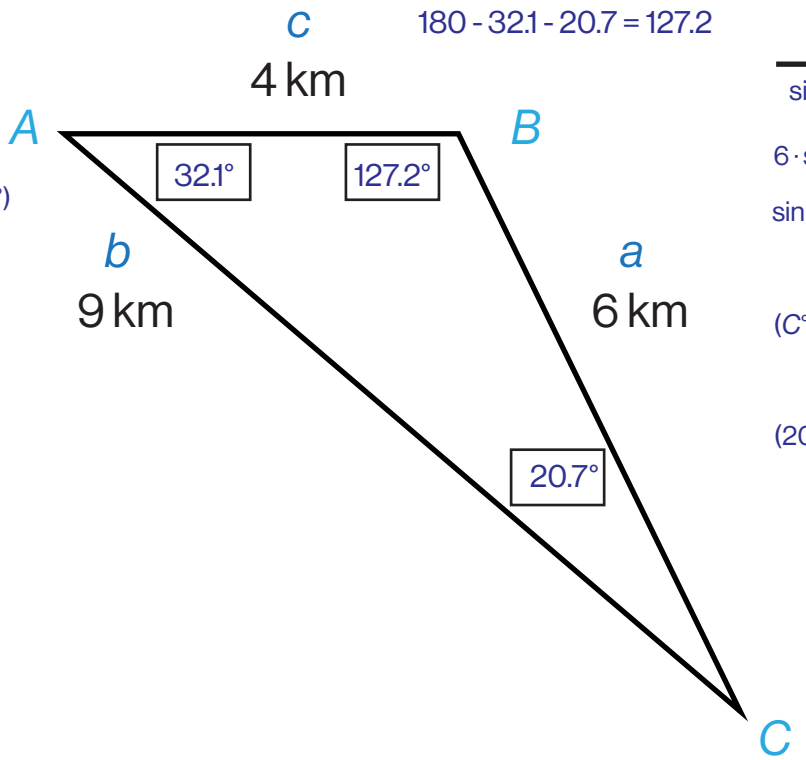
$$\sin(B°) = \frac{20 \cdot \sin(60°)}{26.5}$$

$$(B°) = \sin^{-1}\left(\frac{20 \cdot \sin(60°)}{26.5}\right)$$

$$(40.8°) \approx \sin^{-1}\left(\frac{20 \cdot \sin(60°)}{26.5}\right)$$

II.

$180 - 32.1 - 20.7 = 127.2$



$6^2 = 9^2 + 4^2 - 2 \cdot 9 \cdot 4 \cdot \cos(A°)$

$36 = 81 + 16 - 72\cos(A°)$

$36 = 97 - 72\cos(A°)$

$-61 = -72\cos(A°)$

$$\cos(A°) = \frac{-61}{-72}$$

$$\cos(A°) = \frac{61}{72}$$

$$(A°) = \cos^{-1}\left(\frac{61}{72}\right)$$

$$(32.1°) \approx \cos^{-1}\left(\frac{61}{72}\right)$$

$$\frac{4}{\sin(C°)} = \frac{6}{\sin(32.1°)}$$

$6 \cdot \sin(C°) = 4 \cdot \sin(32.1°)$

$$\sin(C°) = \frac{4 \cdot \sin(32.1°)}{6}$$

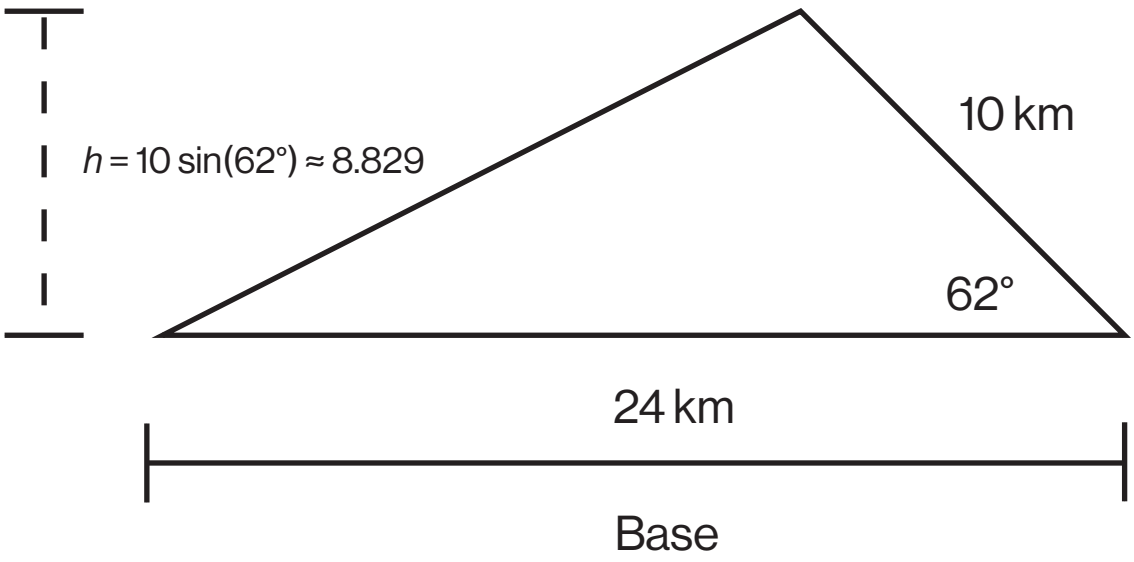
$$(C°) = \sin^{-1}\left(\frac{4 \cdot \sin(32.1°)}{6}\right)$$

$$(20.7°) \approx \sin^{-1}\left(\frac{4 \cdot \sin(32.1°)}{6}\right)$$

Oblique Triangles Practice

Question 4

Determine the area of the triangle (round to the nearest whole number)



$$x = (1/2) \cdot 24 \cdot 8.829 \approx 106$$

$$\text{Area} \approx 106 \text{ km}^2$$