SOLUTIONS => Chapter 4 - Chapter Test (WORKBOOK)

MULTIPLE CHOICE

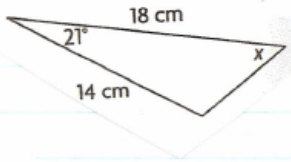
1. Which of the following equations is true?

A. $\sin 60° = \sin 120°$
B. $\sin 80° = -\sin 80°$
C. $\sin 45° = -\sin 135°$
D. all of these

2. Calculate $\tan 78°$ to four decimal places. Predict another expression that equals $\tan 78°$.

A. -4.7046; $\tan 102°$
B. 4.7046; $-\tan 102°$
C. 4.7046; $-\tan 78°$
D. none of these

3. Which law or combination of laws would you use to determine the measure of x in this triangle?



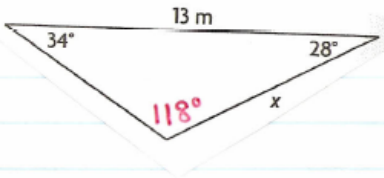
A. the cosine law, once

B. the sine law, twice

C. both the sine law and the cosine law

D. neither the sine law nor the cosine law

4. Determine the length of x, to the nearest meter.



$$\frac{x}{\sin 34^\circ} = \frac{13}{\sin 118^\circ}$$

$$\frac{x \sin 118^\circ}{\sin 118^\circ} = \frac{13 \sin 34^\circ}{\sin 118^\circ}$$

$$x = 8.2\text{ m or } 8\text{ m}$$

A. 118 m

B. 15 m

C. 11 m

D. 8 m

6. In ΔRST, $\angle R = 29°$, $s = 5.4$ m, and $t = 5.8$ m.

Which statement is true for this set of measurements?

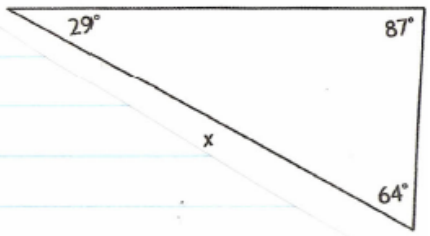
A. This is an *SSA* situation; no triangle is possible.

B. This is an *SSA* situation; only one triangle is possible.

C. This is an *SSA* situation; two triangles are possible.

(D.) This is not an *SSA* situation; only one triangle is possible. * missing "r".

7. Which would you use to determine the length of x?



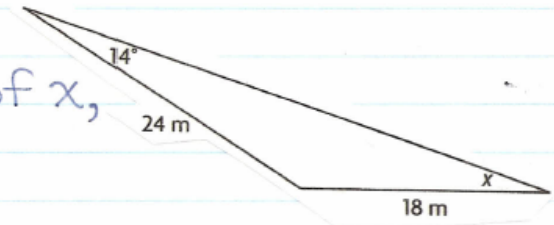
A. the primary trigonometric ratios

B. the sine law

C. the cosine law

(D.) None of the above; x cannot be determined.

8. Determine the measure of x, to the nearest degree.



$$\frac{\sin x}{24} = \frac{\sin 14^\circ}{18}$$

$$\frac{18 \sin x}{18} = \frac{24 \sin 14^\circ}{18}$$

$$\sin x = 0.3226$$

$$x = \sin^{-1}(0.3226)$$

$$x = 19^\circ$$

A. 10°

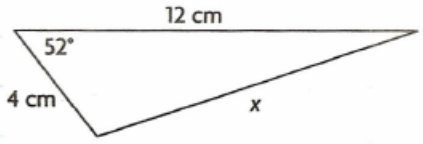
B. 19°

C. 11°

D. None of these; x cannot be determined.

9. Determine the length of x, to the nearest tenth of a centimeter.

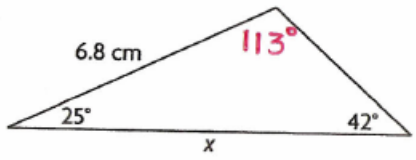
a)



$x =$ 10.0 cm

$x^2 = (4)^2 + (12)^2 - 2(4)(12)\cos 52°$
$x^2 = 16 + 144 - 96(0.6157)$
$x^2 = 160 - 59.1072$
$x^2 = 100.8928$
$x = \sqrt{100.8928}$
$x = 10.0$ cm

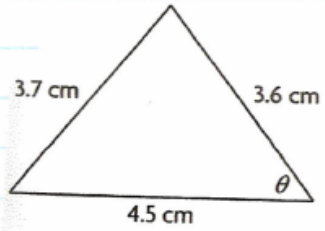
b)



$x =$ 9.4 cm

$\frac{x}{\sin 113°} = \frac{6.8}{\sin 42°}$
$\frac{x \sin 42°}{\sin 42°} = \frac{6.8 \sin 113°}{\sin 42°}$
$x = 9.4$ cm

10. Determine the measure of θ, to the nearest degree.



$\theta = 53°$

$$\cos\theta = \frac{(4.5)^2+(3.6)^2-(3.7)^2}{2(4.5)(3.6)}$$

$$\cos\theta = \frac{20.25+12.96-13.69}{32.4}$$

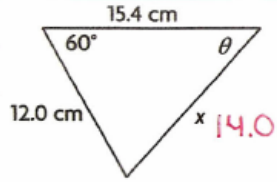
$$\cos\theta = \frac{19.52}{32.4}$$

$$\cos\theta = 0.6025$$

$$\theta = \cos^{-1}(0.6025)$$

$$\theta = 53°$$

11. Determine the length of x to the nearest tenth of a centimeter and the measure of θ to the nearest degree.



$x =$ 14.0 cm $\quad \theta =$ 48°

$x^2 = (12.0)^2 + (15.4)^2 - 2(12.0)(15.4)\cos 60°$
$x^2 = 144 + 237.16 - 369.6(0.5)$
$x^2 = 381.16 - 184.8$
$x^2 = 196.36$
$x = \sqrt{196.36}$
$x = 14.0$ cm

$\frac{\sin\theta}{12.0} = \frac{\sin 60°}{14.0}$

$\frac{14.0\sin\theta}{14.0} = \frac{12.0\sin 60°}{14.0}$

$\sin\theta = 0.7423$
$\theta = \sin^{-1}(0.7423)$
$\theta = 48°$

(12) In $\triangle ABC$: $\angle A = 47°$ (acute), $a = 3.5$cm, $b = 5.0$cm

Determine the # of triangles that are possible

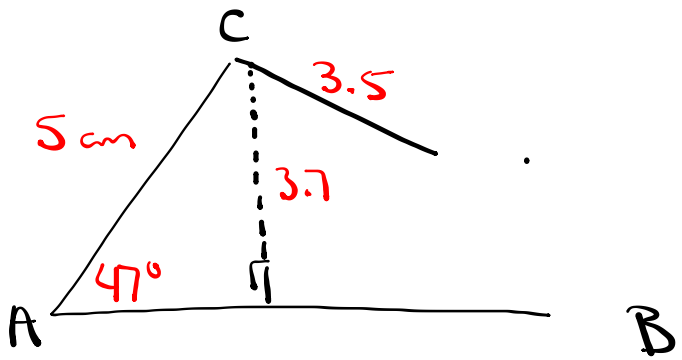
STEP 1: This is SSA

STEP 2: $h = b\sin A$

$h = 5\sin 47°$

$h = 3.7$cm

STEP 3: $a < h \rightarrow$ no triangle is possible.



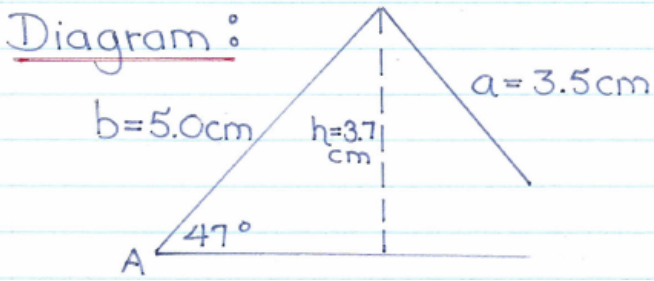
12. In ΔABC, $\angle A = 47°$, $a = 3.5\text{cm}$, and $b = 5.0\text{cm}$. Determine the number of triangles (zero, one, or two) that are possible. Draw a diagram to support your answer.

Since $\angle A$ is acute and $a < b$, I need to check the height "h".

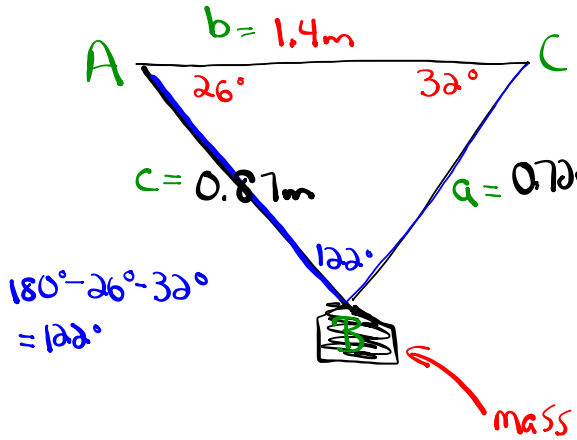
↳ $h = b \sin A$
$h = 5.0 \sin 47°$
$h = 3.7\text{cm}$

* $a < h$, therefore no triangle is possible.

Diagram:



(13) A mass is suspended on a length of cord. The ends of the cord are attached to the ceiling 1.4m apart. The angles formed by the ceiling and the cord are 26° and 32°. Determine the length of cord, to the nearest tenth of a meter.



$\frac{a}{\sin A} = \frac{b}{\sin B}$

$\frac{a}{\sin 26°} = \frac{1.4}{\sin 32°}$

$a \sin 32° = 1.4 \sin 26$

$\frac{a \sin 32°}{\sin 122°} = \frac{1.4 \sin 26}{\sin 32°}$

$a = 0.72$

$\frac{c}{\sin C} = \frac{b}{\sin B}$

$\frac{c}{\sin 32°} = \frac{1.4}{\sin 122°}$

$c \sin 122 = 1.4 \sin 32$

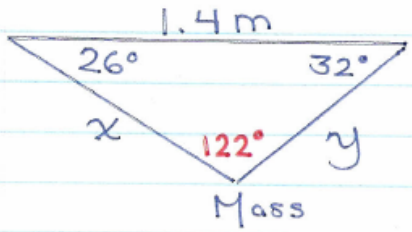
$\frac{c \sin 122}{\sin 122} = \frac{1.4 \sin 32}{\sin 122}$

$c = 0.87$

Total Length = 0.72 + 0.87

= 1.59 m or 1.6m

13. A mass is suspended on a length of a cord. The ends of the cord are attached to the ceiling 1.4 m apart. The angles formed by the ceiling and the cord are 26° and 32°. Determine the length of the cord, to the nearest tenth of a meter.



$$\frac{x}{\sin 32^\circ} = \frac{1.4}{\sin 122^\circ}$$

$$\frac{x \sin 122^\circ}{\sin 122^\circ} = \frac{1.4 \sin 32^\circ}{\sin 122^\circ}$$

$$x = 0.9 \text{ m}$$

$$\frac{y}{\sin 26^\circ} = \frac{1.4}{\sin 122^\circ}$$

$$\frac{y \sin 122^\circ}{\sin 122^\circ} = \frac{1.4 \sin 26^\circ}{\sin 122^\circ}$$

$$y = 0.7 \text{ m}$$

Total length of Cord:

$0.9 \text{ m} + 0.7 \text{ m} = 1.6 \text{ m}.$