

Period: D

Name: KEY

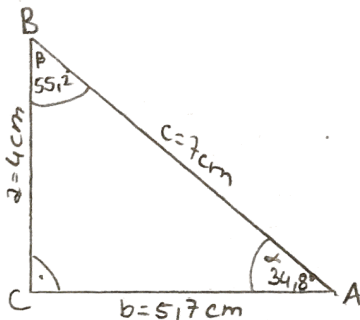
****Chapter 7 Practice Test 2 – Trigonometry**

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Show all of your work.

1) Sketch and solve the following right triangle to the nearest tenth (3 marks):

$\angle C = 90^\circ, a = 4\text{cm}, c = 7\text{cm}$



find β :
 $\cos \beta = \frac{4}{7}$
 $\beta = \cos^{-1}\left(\frac{4}{7}\right)$
 $\beta = 55.2^\circ$

find α :
 $180^\circ - 90^\circ - 55.2^\circ$
 $= 34.8^\circ$

find b :
 $\cos \alpha = \frac{b}{7}$
 $\cos 34.8^\circ \cdot 7 = b$
 $b = 5.7\text{cm}$

ANSWERS:

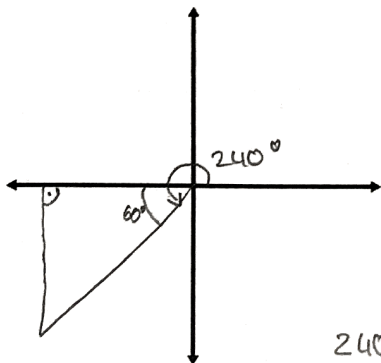
$\angle A = \underline{34.8^\circ}$

$\angle B = \underline{55.2^\circ}$

side $b = \underline{5.7\text{cm}}$

2) Draw each angle in standard position (1 mark each), identify the quadrant in which it lies (0.5 each), and state the reference angle (1 mark each):

a) 240°



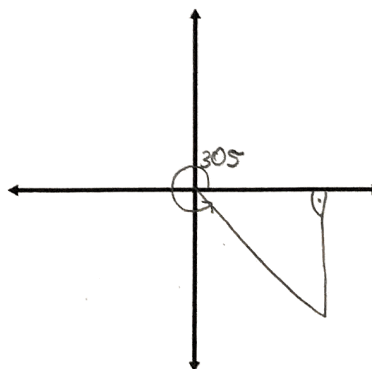
ANSWERS:

quadrant: III

ref \angle : 60°

$240 - 180 = 60$

b) 305°



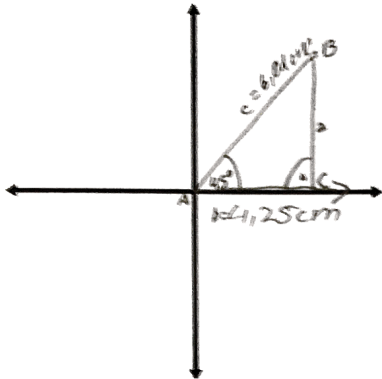
ANSWERS:

quadrant: IV

ref \angle : 55°

$360 - 305 = 55$

3) Suppose you have a standard angle of 45° and the length on the initial arm is 4.25cm. What is the length of the terminal arm to the nearest hundredth? Use an exact ratio from a special triangle for assistance (2 marks).



$$\cos 45^\circ = \frac{4.25}{c}$$

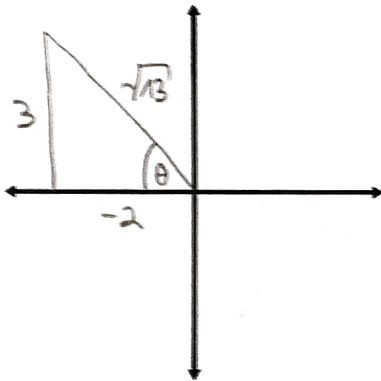
$$c = \frac{4.25}{\cos 45^\circ}$$

$$\underline{c = 6.01 \text{ cm}}$$

ANSWER:

$$c = 6.01 \text{ cm}$$

4) The point $P(-2, 3)$ lies on the terminal arm of an angle θ , in standard position. Sketch and determine the exact trigonometric ratios for $\sin \theta$, $\cos \theta$, & $\tan \theta$ (2 marks).



$$c^2 = a^2 + b^2$$

$$c^2 = 3^2 + (-2)^2$$

$$c^2 = 9 + 4$$

$$c^2 = 13 \quad | \sqrt{\quad}$$

$$c = \sqrt{13}$$

ANSWERS:

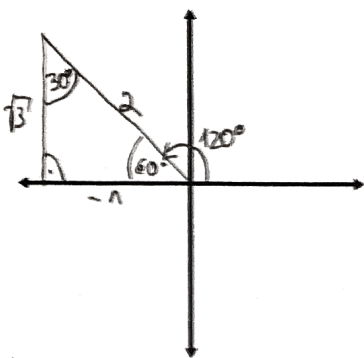
$$\sin \theta = \frac{3}{\sqrt{13}}$$

$$\cos \theta = \frac{-2}{\sqrt{13}}$$

$$\tan \theta = \frac{3}{-2} = -\frac{3}{2}$$

5) Determine the exact value (2 marks each).

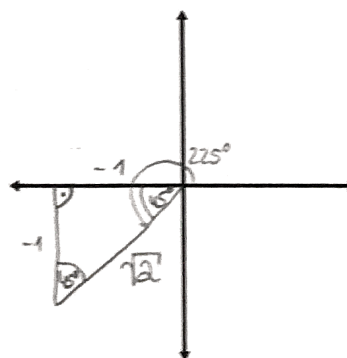
a) $\cos 120^\circ$



ANSWER:

$$\cos 120^\circ = \frac{-1}{2}$$

b) $\sin 225^\circ$



ANSWER:

$$\sin 225^\circ = \frac{-1}{\sqrt{2}}$$

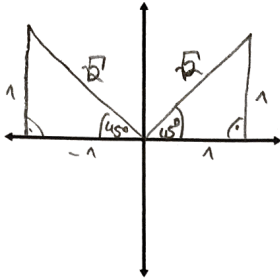
$$180^\circ - 120^\circ = 60^\circ$$

$$225^\circ - 180^\circ = 45^\circ$$

S	A
T	C

6) Solve for θ (2 marks each).

a) $\sin \theta = \frac{1}{\sqrt{2}}, 0^\circ \leq \theta \leq 360^\circ$



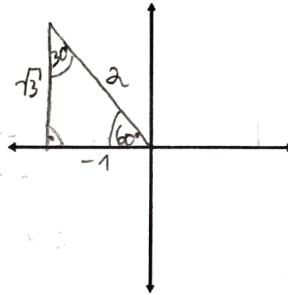
$$\theta_1 = 45^\circ$$

$$\theta_2 = 180^\circ - 45^\circ = 135^\circ$$

ANSWER(S):

$$\theta = 45^\circ; 135^\circ$$

b) $\tan \theta = -\frac{\sqrt{3}}{1}, 90^\circ \leq \theta \leq 270^\circ$



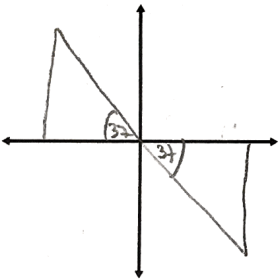
$$\theta_2 = 180^\circ - 60^\circ = 120^\circ$$

ANSWER(S):

$$\theta = 120^\circ$$

7) Determine the measure of θ to the nearest degree (2 marks).

$$\tan \theta = -0.7535540501, 0^\circ \leq \theta < 360^\circ$$



$$\tan^{-1}(0,7535540501) = 37^\circ$$

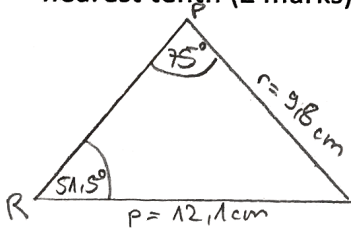
$$\theta_2 = 180^\circ - 37^\circ = 143^\circ$$

$$\theta_4 = 360^\circ - 37^\circ = 323^\circ$$

ANSWER(S):

$$\theta = 143^\circ; 323^\circ$$

8) In an oblique triangle, $\angle P = 75^\circ$, side $p = 12.1$ cm, & side $r = 9.8$ cm. What is $\angle R$ to the nearest tenth (2 marks)?



$$\frac{\sin P}{p} = \frac{\sin R}{r}$$

$$\frac{\sin 75^\circ}{12.1} = \frac{\sin R}{9.8}$$

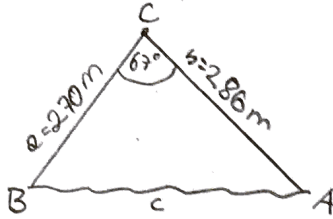
$$\sin R = \frac{9.8 \cdot \sin 75^\circ}{12.1}$$

$$\sin^{-1} 0,78232 = 51,5^\circ$$

ANSWER:

$$\angle R = 51,5^\circ$$

9) A hot air balloon is travelling over a Roman aqueduct. The angle (at the balloon) between the line of sight to one end of the aqueduct and the line of sight to the other end of the aqueduct is 67° . The length along the line of sight to one end is 270m, and the length along the line of sight to the other end is 286m. How long is the aqueduct to the nearest tenth (3 marks)?



$$c^2 = a^2 + b^2 - 2ab \cdot \cos C$$

$$c^2 = (270)^2 + (286)^2 - 2 \cdot 270 \cdot 286 \cdot \cos 67^\circ$$

$$c^2 = 94.351,48 \quad | \sqrt{\quad}$$

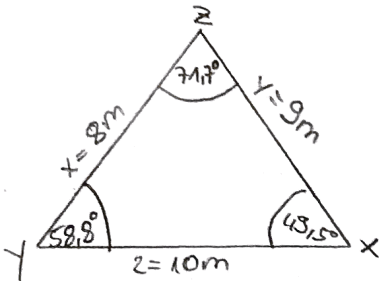
$$c = \underline{\underline{307,2}}$$

SENTENCE ANSWER:

The Roman aqueduct is 307,2 meters long.

10) Solve the following triangle to the nearest tenth (3 marks):

$$x = 8m, y = 9m, z = 10m$$



find $\angle X$:

$$c^2 = a^2 + b^2 - 2ab \cdot \cos C$$

$$x^2 = y^2 + z^2 - 2yz \cdot \cos X$$

$$8^2 = 9^2 + 10^2 - 2 \cdot 9 \cdot 10 \cdot \cos X$$

$$64 = 81 + 100 - 180 \cdot \cos X$$

$$64 = 181 - 180 \cdot \cos X \quad | -181$$

$$-117 = -180 \cdot \cos X \quad | :(-180)$$

$$0,65 = \cos X$$

$$\underline{\underline{\cos^{-1} 0,65 = 49,5^\circ}}$$

find $\angle Y$:

$$\frac{\sin X}{x} = \frac{\sin Y}{y}$$

$$\frac{\sin 49,5^\circ}{8} = \frac{\sin Y}{9}$$

$$\sin Y = \frac{9 \cdot \sin 49,5^\circ}{8}$$

$$\underline{\underline{\sin^{-1} 0,85546 = 58,8^\circ}}$$

find $\angle Z$:

$$180^\circ - 49,5^\circ - 58,8^\circ$$

$$= \underline{\underline{71,7^\circ}}$$

ANSWERS:

$$\angle X = \underline{49,5^\circ}$$

$$\angle Y = \underline{58,8^\circ}$$

$$\angle Z = \underline{71,7^\circ}$$