

Name _____

Date _____

VERTEXMATH • BUILD YOUR OWN • MCR3U GRADE 11

Trigonometric Ratios: your summary

1 Fill in every blank from memory. No notes.

2 Check it against the Unit Summary in a different colour.

3 Tick ✓ or X on each card. Every X is a topic to review.

vertexmath.ca
Worksheet, answers &
this cheat sheet



Which tool?

Write the tool for each case.

A 90° angle

SAS · SSS

AAS · ASA · SSA

1 Right triangles

✓ X

1 Write $\sin \theta$, $\cos \theta$ and $\tan \theta$ as side ratios.

2 A ramp rises 1.5 m along a 9 m slope. Find its angle of elevation.

2 Special angles

✓ X

3 Fill in the exact values of $\sin$, $\cos$ and $\tan$ for 30° , 45° and 60° .

3 Any angle to 360°

✓ X

4 Which ratio is positive in each quadrant? Write the formula for β in each.

5 Find $\cos 300^\circ$ exactly. Name the quadrant, β and the sign.

6 Give one positive and one negative angle coterminal with 115° .

4 Find θ from a ratio

✓ X

7 Solve $\sin \theta = 0.4$ for $0^\circ \leq \theta \leq 360^\circ$.

5 Identities

✓ X

8 Write the Pythagorean, quotient and reciprocal identities.

9 $\cos \theta = -20/29$ and θ is in QII. Find $\sin \theta$.

10 Prove $\tan \theta \cos \theta = \sin \theta$.

6 Sine law

✓ X

11 Write the sine law. When does it apply?

12 In $\triangle PQR$, $\angle P = 40^\circ$, $\angle Q = 75^\circ$ and $r = 12$. What do you find first, and why?

7 The ambiguous case (SSA)

✓ X

13 Acute $\angle A$, $h = b \sin A$: when are there 0, 1 or 2 triangles? Add the obtuse $\angle A$ cases.

14 $\angle A = 35^\circ$, $b = 12$, $a = 9$. How many triangles?

8 Cosine law

✓ X

15 Write the cosine law to find a side, and to find an angle.

16 Sides 7, 9 and 12: which angle do you find first, and why?

9 3D problems

✓ X

17 Your step-by-step plan for a problem with two triangles in different planes. (no single answer)

My traps Your three most likely mistakes, and how you will catch each one.

1 _____ **2** _____ **3** _____

12 $\angle R = 65^\circ$, the angle opposite r , so r has a pair
13 acute: $a < h$ none, $a = h$ one, $h < a < b$ two, $a \geq b$ one; obtuse: $a \leq b$ none, $a > b$ one
14 $h \approx 6.9$ and $6.9 < 9 < 12$: two
15 $c^2 = a^2 + b^2 - 2ab \cos C$; $\cos C = (a^2 + b^2 - c^2)/(2ab)$
16 The angle opposite 12, the largest; the other two are then acute

7 $\beta \approx 23.6^\circ$; α and α II: $\theta \approx 23.6^\circ$ or 156.4°
8 $\sin^2 \theta + \cos^2 \theta = 1$; $\tan \theta = \sin \theta / \cos \theta$; $\csc \theta = 1 / \sin \theta$, $\sec \theta = 1 / \cos \theta$, $\cot \theta = 1 / \tan \theta$
9 $\sin \theta = 21/29$ (positive in α II)
10 $\tan \theta \cos \theta = \frac{\sin \theta}{\cos \theta} \cdot \cos \theta = \sin \theta$
11 $a / \sin A = b / \sin B = c / \sin C$; AAS, SSA, and ASA after finding the third angle

1 opp/hyp, adj/hyp, opp/adj
2 $\sin^{-1}(1.5/9) \approx 9.6^\circ$
3 $\sin: 1/2, \sqrt{2}/2, \sqrt{3}/2, \cos: \sqrt{3}/2, \sqrt{2}/2, 1/2$; $\tan: \sqrt{3}/3, 1, \sqrt{3}$
4 α all, θ ; α II $\sin, 180^\circ - \theta$; α III $\tan$, $\theta - 180^\circ$; α IV $\cos, 360^\circ - \theta$
5 α IV, $\beta = 60^\circ$, positive: $1/2$
6 475° and -245°

Answers • Answers to the numbered prompts. Cover this strip until you are done.