

Trigonometric Ratios Review

Answer key Final answers only. Try first, then check.

CORE SKILLS

- K1**
- a) $\sin P = \frac{15}{17}$, $\cos P = \frac{8}{17}$, $\tan P = \frac{15}{8}$
 - b) $\angle P \approx 61.9^\circ$
 - c) $AC = \frac{8}{\sin 35^\circ} \approx 13.9$ cm
-
- K2**
- a) 110° : 70° , negative; 250° : 70° , positive; 335° : 25° , negative
 - b) $\sin 240^\circ = -\frac{\sqrt{3}}{2}$, $\cos 240^\circ = -\frac{1}{2}$, $\tan 240^\circ = \sqrt{3}$
 - c) $\frac{3 + 2\sqrt{2}}{4}$
-
- K3**
- a) $\cos \theta = \frac{15}{17}$
 - b) $\tan \theta = -\frac{8}{15}$, $\csc \theta = -\frac{17}{8}$
 - c) $2 \tan \theta$; $-\frac{16}{15}$
-
- K4**
- a) $d \approx 14.1$ cm
 - b) $e \approx 16.9$ cm
 - c) $\angle Y \approx 43.1^\circ$
-
- K5**
- a) $a \approx 7.4$ cm
 - b) $\angle M \approx 113.6^\circ$
 - c) $u \approx 13.4$ cm

REAL WORLD

- A1**
- a) $\angle ACT \approx 45.0^\circ$ or 135.0°
 - b) It gains signal 3.8 km from A and loses it 16.5 km from A: 12.7 km with signal.
 - c) $\sin \angle ACT = \frac{12 \sin 32^\circ}{6} \approx 1.06 > 1$: no such angle, so no point of the highway is within 6 km of the tower (the closest is about 6.4 km). Drivers never get signal from it.
-
- A2**
- a) 113.8° , at the corner opposite the 8.0 m edge
 - b) 39.0°
 - c) $\cos C = \frac{3^2 + 4.5^2 - 8^2}{2(3)(4.5)} \approx -1.29 < -1$: no such angle. The bed can't be built: $3.0 + 4.5 < 8.0$, so the two short edges can't meet.
-
- A3**
- a) $\angle P = 40^\circ$, $\angle Q = 30^\circ$, $\angle B = 110^\circ$
 - b) $PB \approx 1.60$ km, so the height is about 581 m
 - c) No. The rangefinder measures the line of sight, $\frac{PB}{\cos 20^\circ} \approx 1.70$ km, which is more than 1.65 km, even though the ground distance $PB \approx 1.60$ km is within range.

THINK IT THROUGH

- T1**
- a) Cross-multiplying assumes the two sides are already equal and changes both at once. A proof must start from one side and transform it into the other.
 - b) $LS = \frac{\cos x}{1 - \sin x} \cdot \frac{1 + \sin x}{1 + \sin x} = \frac{\cos x(1 + \sin x)}{1 - \sin^2 x} = \frac{\cos x(1 + \sin x)}{\cos^2 x} = \frac{1 + \sin x}{\cos x} = RS$
 - c) e.g. $x = 45^\circ$: $\sin 45^\circ + \cos 45^\circ = \sqrt{2} \approx 1.41 \neq 1$
-
- T2**
- a) $\angle C \approx 118.8^\circ$. $\angle C$ and $\angle B$ are wrong ($\angle B \approx 37.4^\circ$); $\angle A$ is correct.
 - b) $\sin C \approx 0.876$ has two solutions between 0° and 180° , 61.2° and 118.8° ; the calculator returns only the acute one. Finding the largest angle first with the cosine law avoids this.
 - c) $3\sqrt{13} < c < 15$ (about $10.8 < c < 15$)

BOSS LEVEL

- Boss**
- a) From A : h ; from B : $h\sqrt{3}$
 - b) $h = 50\sqrt{2} \approx 70.7$ m
 - c) $\tan \theta = \frac{50\sqrt{2}}{50\sqrt{3}} = \frac{\sqrt{6}}{3}$, so $\theta \approx 39.2^\circ$
-

Free worksheet · vertexmath.ca · Free to print and share for classroom use

Free to print, copy, adapt and share for classroom use · CC BY-NC 4.0 · © VertexMath



vertexmath.ca

Hints, answers &
more worksheets