

Geometry · Right Triangle Trigonometry · Test Answer Key

Common Core G-SRT.C.6, G-SRT.C.7, G-SRT.C.8 · mathovore.fr

Use this answer key to score the right triangle trigonometry test. Each solution shows the setup, the rounded result and how the points are awarded. Give partial credit for a correct method with a small rounding slip, and total the points out of 20.

Geometry Common Core: G-SRT.C.6 · G-SRT.C.7 · G-SRT.C.8

Question 1: Ratios in a right triangle (2 points)

- a. $\sin A = \frac{12}{37}$, $\cos A = \frac{35}{37}$, $\tan A = \frac{12}{35}$
b. $\sin B = \frac{35}{37}$, $\cos B = \frac{12}{37}$

Scoring: part (a) 1 point for all three correct ratios (accept 1 point only if all three are correct); part (b) 1 point for both correct.

Question 2: Similar triangles and sine (2 points)

- a. Since $\sin D = \sin A$, $\frac{EF}{39} = \frac{10}{26}$. Then $EF = \frac{10 \cdot 39}{26} = 15$. $EF = 15$
b. The triangles are similar by AA, so corresponding sides are proportional. Then $\frac{BC}{AB} = \frac{EF}{DE}$, and these are the sine of angles A and D .

Scoring: (a) 1 point for a correct proportion and the value 15; (b) 1 point for naming similarity and proportional sides.

Question 3: Complementary angles (2 points)

- a. The complement of 17° is 73° . $\sin 17^\circ = \cos 73^\circ$
b. The angles are complementary: $(4x-6) + (x+11) = 90$, so $5x+5 = 90$ and $x = 17$. $x = 17$

Scoring: (a) 1 point; (b) 1 point for the complementary equation and the correct value.

Question 4: Special right triangles (2 points)

- a. The hypotenuse is the leg times $\sqrt{2}$, so each leg is $\frac{10\sqrt{2}}{\sqrt{2}} = 10$. **10 in**
b. The hypotenuse is $2(8) = 16$ and the longer leg is $8\sqrt{3}$. **16 cm, $8\sqrt{3}$ cm**

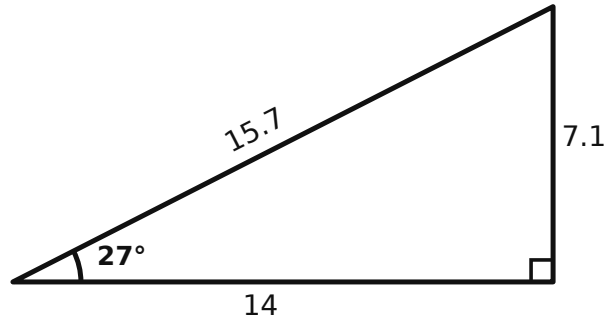
Scoring: (a) 1 point; (b) 1 point for both lengths (accept 13.9 cm as an approximation of the long leg).

Question 5: Finding sides (2 points)

x is opposite and 14 is adjacent: $x = 14 \tan 27^\circ \approx 7.1$.

y is the hypotenuse: $y = \frac{14}{\cos 27^\circ} \approx 15.7$.

$x \approx 7.1$, $y \approx 15.7$



Both unknown sides found.

Scoring: 1 point for each correct side. Award 1 point total if a correct setup has a rounding or calculator-mode slip.

Question 6: Finding angles (2 points)

a. $\sin P = \frac{9}{13}$, so $m \angle P = \sin^{-1}\left(\frac{9}{13}\right) \approx 43.8^\circ$. 43.8°

b. $\tan Q = \frac{15}{6} = 2.5$, so $m \angle Q = \tan^{-1}(2.5) \approx 68.2^\circ$. 68.2°

Scoring: 1 point for each angle, 1 point if the correct inverse function is set up but the answer is off by rounding.

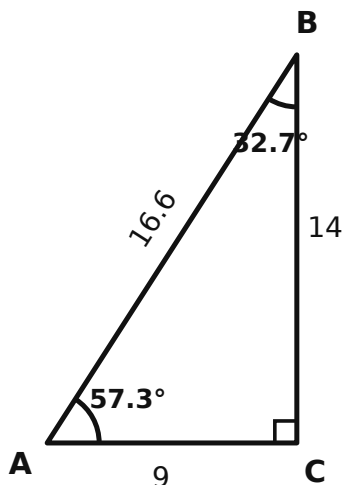
Question 7: Solve a right triangle (3 points)

Hypotenuse: $AB = \sqrt{14^2 + 9^2} = \sqrt{277} \approx 16.6$.

$\tan A = \frac{14}{9}$, so $m \angle A \approx 57.3^\circ$.

$m \angle B = 90^\circ - 57.3^\circ = 32.7^\circ$.

$AB \approx 16.6$, $m \angle A \approx 57.3^\circ$, $m \angle B \approx 32.7^\circ$



All parts of the triangle.

Scoring: 1 point for each correct part. Accept a correct method with a rounding difference of 0.1.

Question 8: Angle of depression (3 points)

The angle of depression equals the angle of elevation from the boat (alternate interior angles), so the angle at the boat is 21° .

$$\tan 21^\circ = \frac{90}{d}, \text{ so } d = \frac{90}{\tan 21^\circ} \approx 234.5.$$

$$d \approx 234.5 \text{ ft}$$

Scoring: 1 point for the angle at the boat (21 degrees); 1 point for the tangent equation; 1 point for the correct distance.

Question 9: Zip line (2 points)

$$\text{Cable (hypotenuse): } \sin 25^\circ = \frac{32}{L}, \text{ so } L = \frac{32}{\sin 25^\circ} \approx 75.7.$$

$$\text{Horizontal distance (adjacent): } \tan 25^\circ = \frac{32}{x}, \text{ so } x = \frac{32}{\tan 25^\circ} \approx 68.6.$$

$$\text{cable} \approx 75.7 \text{ ft, horizontal} \approx 68.6 \text{ ft}$$

Scoring: 1 point for each correct measurement.

Total
20 points