

Grade 8 · The Pythagorean Theorem · Test Answer Key

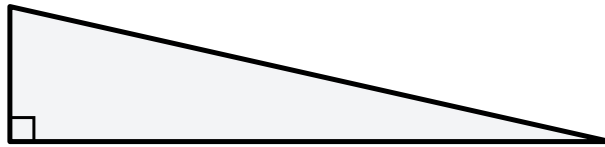
Common Core 8.G.B.6, 8.G.B.7 · mathovore.fr

Use this key to score the Pythagorean Theorem test out of 20 points. Each solution shows the full calculation, and the scoring note explains where partial credit is earned. Accept answers rounded correctly and award full credit for equivalent exact forms.

Grade 8 Common Core: 8.G.B.6 · 8.G.B.7

Question 1: Hypotenuse (2 points)

$40^2 + 9^2 = 1600 + 81 = 1681$, so $c = \sqrt{1681} = 41$. The hypotenuse is **41 in.**



Solved triangle.

Scoring: 1 point for the correct equation $40^2 + 9^2 = c^2$, 1 point for 41 in.

Question 2: Missing leg (2 points)

$10^2 + b^2 = 26^2$, so $b^2 = 676 - 100 = 576$ and $b = 24$. The other leg is **24 ft.**

Scoring: 1 point for subtracting the squares correctly (576), 1 point for 24 ft.

Question 3: Rounded hypotenuse (2 points)

$5^2 + 9^2 = 25 + 81 = 106$, so $c = \sqrt{106} \approx 10.30$. The hypotenuse is about **10.3 in.**

Scoring: 1 point for $c^2 = 106$, 1 point for the correctly rounded answer.

Question 4: Right triangle or not (3 points)

- a. $12^2 + 35^2 = 144 + 1225 = 1369 = 37^2$. **Right triangle.**
- b. $10^2 + 24^2 = 100 + 576 = 676$, but $27^2 = 729$. **Not a right triangle.**
- c. $16^2 + 30^2 = 256 + 900 = 1156 = 34^2$. **Right triangle.**

Scoring: 1 point per part: the calculation with the longest side as the hypotenuse and the

correct conclusion.

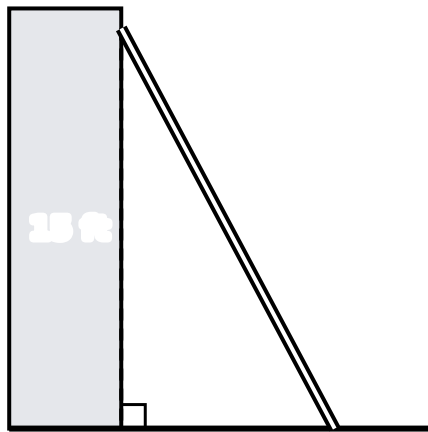
Question 5: Area proof (2 points)

- a. Big square: $7^2 = 49$. Triangles: $4 \cdot \frac{1}{2} \cdot 3 \cdot 4 = 24$. Tilted square: $49 - 24 = \mathbf{25 \text{ square inches}}$.
b. $\sqrt{25} = \mathbf{5 \text{ in.}}$

Scoring: 1 point for each part.

Question 6: Ladder (2 points)

$x^2 + 15^2 = 17^2$, so $x^2 = 289 - 225 = 64$ and $x = 8$. The base is **8 ft** from the wall.



Solved: 8 ft.

Scoring: 1 point for the equation with 17 as the hypotenuse, 1 point for 8 ft.

Question 7: TV screen (3 points)

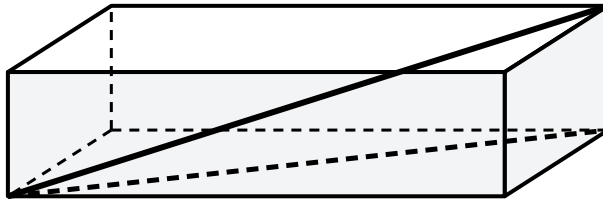
- a. $40^2 + h^2 = 50^2$, so $h^2 = 2500 - 1600 = 900$ and $h = \mathbf{30 \text{ in.}}$
b. $40 \cdot 30 = \mathbf{1,200 \text{ square inches}}$.

Scoring: Part (a): 1 point for the equation, 1 point for 30 in. Part (b): 1 point.

Question 8: Rod in a box (2 points)

Base diagonal: $x^2 = 24^2 + 10^2 = 576 + 100 = 676$, so $x = 26$. Space diagonal:
 $d^2 = 26^2 + 6^2 = 676 + 36 = 712$, so $d \approx 26.7 \text{ in.}$

Since 26.7 is less than 30, the rod **does not fit**.



The longest rod is about 26.7 in.

Scoring: 1 point for finding the space diagonal ($d^2 = 712$), 1 point for comparing with 30 and concluding no.

Question 9: Cutting across the park (2 points)

Diagonal: $120^2 + 50^2 = 14400 + 2500 = 16900$, so $d = 130$ yd. Along two sides: $120 + 50 = 170$ yd.

Difference: $170 - 130 = 40$ yd **shorter**.

Scoring: 1 point for the diagonal length 130 yd, 1 point for the difference 40 yd.

Total
20 points