



Heights & Distances

SCORE

___ / 20

Chapter: Trigonometry • Level ★★★ • Time: 30 min

Name _____ Class _____ Date _____

AFTER THIS WORKSHEET YOU CAN

- ✓ Use angles of elevation and depression.
- ✓ Use tan to find heights.
- ✓ Solve real-world distance problems.
- ✓ Identify the information needed to solve.



Section A • Concept Check

• BEGINNER

4 × 1 = 4

- 1 60 m from a building, elevation 35° . The height is:
☐ A. $60 \cdot \tan(35^\circ) \approx 42$ m ☐ B. $60 \cdot \sin(35^\circ)$
☐ C. $60 / \tan(35^\circ)$ ☐ D. 35 m
- 2 From a 120 m lighthouse, depression to a ship is 15° . The distance is:
☐ A. $120 / \tan(15^\circ) \approx 447.8$ m ☐ B. $120 \cdot \tan(15^\circ)$
☐ C. $120 \cdot \sin(15^\circ)$ ☐ D. 15 m
- 3 A ladder at 70° , foot 3 m from the wall, reaches:
☐ A. $3 \cdot \tan(70^\circ) \approx 8.24$ m ☐ B. $3 \cdot \sin(70^\circ)$
☐ C. $3 / \tan(70^\circ)$ ☐ D. 70 m
- 4 A tower's shadow is 25 m when the sun's elevation is 40° . The height is:
☐ A. $25 \cdot \tan(40^\circ) \approx 20.98$ m ☐ B. $25 / \tan(40^\circ)$
☐ C. $25 \cdot \cos(40^\circ)$ ☐ D. 40 m



Section B • Problem Solving

• INTERMEDIATE

2 + 3 × 3 = 11

- 5 The angle measured upward from the horizontal is the angle of _____
- 6 The angle measured downward from the horizontal is the angle of _____
- 7 A person 60 m from a building measures a 35° angle of elevation. Find the height.

- 8 From a 120 m lighthouse, the depression to a ship is 15° . Find the distance to the ship.

- 9 A ladder makes 70° with the ground, its foot 3 m from the wall. Find how high it reaches.



Section C • Challenge

• CHALLENGE

5

- 10 A tower casts a 25 m shadow when the sun's elevation is 40° . Find the tower's height.

Reflection — the most useful thing I learned: _____

A ___/4 B ___/11 C ___/5 Total ___/20

Teacher's Signature

Parent's Signature

ANSWER KEY — FOLD OR CUT BEFORE HANDING OUT

1-A 2-A 3-A 4-A | 5 elevation 6 depression 7 = $60 \cdot \tan(35^\circ) \approx 42$ m 8 = $120 / \tan(15^\circ) \approx 447.8$ m
 9 = $3 \cdot \tan(70^\circ) \approx 8.24$ m | 10 = $25 \cdot \tan(40^\circ) \approx 20.98$ m

