

Unit 1 Practice - Solutions & Hints

Lesson 1 - Measurement Challenges

Solutions will vary.

Lesson 2 - Proportionality and Similar Triangles

Lesson 3 - The Tangent Ratio

- 1.
2. a. They are equal
b. They are parallel
3. a) 0.15 b) 8.5 degrees e) 10.6
4. d) 91.8m
5. 13.8m
- 6.
7. b) 15.4m
8. You could draw a similar triangle and use the proportionality of similar triangles
9. b) 55 degrees

Lesson 4 - Sine and Cosine

1.
 - a. 0.5
 - b. 0.866
 - c. 0.866
 - d. 0.5
 - e. 30°
 - f. 60°
2.
 - a. $5/13$
 - b. $12/13$
 - c. $12/13$
 - d. $5/13$
 - e. 23°
 - f. 67°
3.
 - a. 0.93
 - b. 0.37
 - c. 0.37
 - d. 0.37
4.
 - a. 21.3
 - b. 14.9
 - c. $14.9/26 = 0.57$
 - d. $21.3/26 = 0.82$
- 5.
6.
 - a. The tangent is slope. To find the tangent, divide rise by run (divide sine by cosine)
 - b. 0.7 and 1.4
 - c. It becomes greater than 1
7. Based on the approach using shadows, as shown in the lesson video:
 - a. Min: 0, Max: 1
 - b. Min: 0, Max: 1
 - c. Min: 0, Max: infinite (explain why this is the case!)

Lesson 5 - Right Triangle Trigonometry

1.
 - a. 1
 - b. 5.5
 - c. 30.6
 - d. 71
 - e. 500
2.
 - a. 68°
 - b. 30°
 - c. 49°
3. Solve (completely measure) each right triangle.
 - a. Angles: 20° , 70° , 90° Sides: 0.34, 0.94, 1
 - b. Angles: 30.5° , 59.5° , 90° Sides: 33, 56, 65
4. Angles: 35° , 55° , 90° Sides: 100, 142.8, 174.3
- 5.
6. Base: 32.17, Height: 13.79, Diagonal: 35, Angle: 23.2° or 66.8°

Lesson 6 - Applications of Right Triangle Trigonometry

1. 594.7 m
2. 59 m
3. 31.5°
4. 324 m
5. 67.4°
6.
 - a. 55.9 m
 - b. 57 m
 - c. 5.4 m
7. 32.4 ft
8.
 - a. 294.4 ft
 - b. 9.6 ft/s
 - c. 11 seconds more
9. 463.2 ft

Lesson 7 - The Pythagorean Theorem

1. 125.1 m
2. 55
3. No
4. 15.6
5. 127.3 ft
6. The diagonal of the door frame is 93.9 feet, so the table will not fit
7. 8.54 m
8.
 - a. 15 steps
 - b. 420 cm
 - c. 499.3 cm
9. $x = 5$, the sides are 6, 8, 10
10. 72 cm and 65 cm

Lesson 8 - Area

- 1) The rectangle
 - 2)
 - a. 136 square cm
 - b. 36 square cm
 - 3) 30
 - 4) 248.8
 - 5) 311.6 square inches, the 32 inch monitor is 40% bigger
 - 6) 295.2
 - 7)
 - a) $A = .5 \cdot h \cdot b_1 + .5 \cdot h \cdot b_2$
 - 8) The areas are equal
 - 9)
 - 10) No
 - 11) It works for all rectangles (which include squares)
 - 12)
 - 13)
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10. Drop a perpendicular from the largest angle to the opposite side. Then use the two right triangles to prove the proposition
 11. Drop a perpendicular from the right angle to the hypotenuse. The proof follows from here. This implies that the two acute angles of a right triangle are complementary (add to 90 degrees).