Name _____ Date _____ Class_____

Problem Solving

Similarity in Right Triangles

1. A sculpture is 10 feet long and 6 feet wide. The artist made the sculpture so that the height is the geometric mean of the length and the width. What is the height of the sculpture to the nearest tenth of a foot?

_____

2. The altitude to the hypotenuse of a right triangle divides the hypotenuse into two segments that are 12 mm long and 27 mm long. What is the area of the triangle?

_____

3. The perimeter of △ABC is 56.4 cm, and the perimeter of △GHJ is 14.1 cm. The perimeter of △DEF is the geometric mean of these two perimeters. What is the perimeter of △DEF?
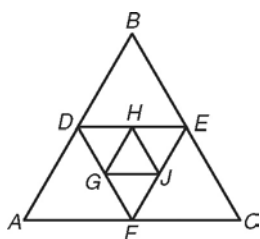
4. Tamara stands facing a painting in a museum. Her lines of sight to the top and bottom of the painting form a 90° angle. How tall is the painting?

5 ft

4 ft

_____
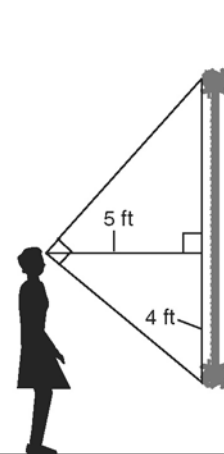
Choose the best answer.

5. The altitude to the hypotenuse of a right triangle divides the hypotenuse into two segments that are x cm and $4x$ cm, respectively. What is the length of the altitude?

   A $2x$ C $5x$

   B $2.5x$ D $4x^2$

6. Jack stands 9 feet from the primate enclosure at the zoo. His lines of sight to the top and bottom of the enclosure form a 90° angle. When he looks straight ahead at the enclosure, the vertical distance between his line of sight and the bottom of the enclosure is 5 feet. What is the height of the enclosure?

   F 16.2 ft   H 23.8 ft

   G 21.2 ft   J 28.8 ft

7. A surveyor sketched the diagram at right to calculate the distance across a ravine. What is x, the distance across the ravine, to the nearest tenth of a meter?

   A 7.2 m   C 16.4 m

   B 12.2 m   D 64.7 m

Holt McDougal Geometry
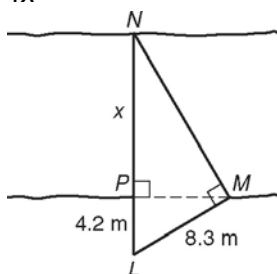
Answers for the chapter Right Triangles and Trigonometry

8-1 SIMILARITY IN RIGHT TRIANGLES

Practice A

1. square root　　2. altitude

3. $\triangle ABC \sim \triangle DBA \sim \triangle DAC$

4. 6　　　　　　　5. 12

6. 10　　　　　　7. $\dfrac{y}{\boxed{h}}$

8. $\dfrac{\boxed{c}}{\boxed{a}}$　　　9. $\dfrac{b}{y} = \dfrac{c}{\boxed{b}}$

10. xy　　　　　11. $xc;\ yc$

12. $4;\ 4\sqrt{5}\ ;\ 2\sqrt{5}$

Practice B

1. Possible answers: $\triangle JKL \sim \triangle JLM \sim \triangle LKM$

2. $\triangle DEF \sim \triangle GED \sim \triangle GDF$

3. $\triangle WXY \sim \triangle ZXW \sim \triangle ZWY$

4. 1　　　　　　5. 15

6. $6\sqrt{2}$　　　7. $\dfrac{3\sqrt{2}}{2}$

8. $2\sqrt{35}$　　　9. 7

10. $\sqrt{35};2\sqrt{15};2\sqrt{21}$

11. $30;\ 10\sqrt{3}\ ;\ 20\sqrt{3}$　　12. $2;\ \sqrt{15}\ ;\ \sqrt{10}$

13. $3\sqrt{10}\ ;\ 3\sqrt{35}\ ;\ 3\sqrt{14}$

14. $144;\ 60;\ 156$　　15. $12;\ 9\sqrt{13}\ ;\ 6\sqrt{13}$

16. 3,807 feet　　17. $\dfrac{e}{b} = \dfrac{\boxed{c}}{e}$

18. $\dfrac{d}{b+c} = \dfrac{\boxed{e}}{a}$　　19. $\dfrac{d}{\boxed{c}} = \dfrac{a}{e}$

Practice C

1. $\dfrac{49}{25};\dfrac{576}{25}$

2. $19 - \sqrt{105};\ 19 + \sqrt{105}$

3. $30;\ 10\sqrt{3}$

4. a and b have the same geometric and arithmetic means if $a = b$.

5.
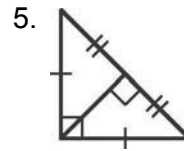
6. 45°, 45°, 90°

7. There are no conditions under which the arithmetic mean will be less than the geometric mean.

8. 5435 ft^2　　　　9. 357 ft

10. $\dfrac{15}{4} = 3\dfrac{3}{4}$ in.　　11. $\dfrac{20}{3} = 6\dfrac{2}{3}$ in.

12. $\dfrac{5}{12}\sqrt{193}$ in. $\approx 5\dfrac{3}{4}$ in.

Reteach

1. $\triangle MNL \sim \triangle NPL \sim \triangle MPN$

2. $\triangle FGH \sim \triangle FJG \sim \triangle GJH$

3. 9　　　　　　4. 12

5. $2\sqrt{5}$　　　6. $4\sqrt{6}$

7. $8;\ 4\sqrt{5}\ ;\ 2\sqrt{5}$

8. $3\sqrt{2}\ ;\ 3\sqrt{6}\ ;\ 3\sqrt{3}$

9. $4;\ 2\sqrt{13}\ ;\ 3\sqrt{13}$

10. $28;\ 4\sqrt{7}\ ;\ 8\sqrt{14}$

Challenge

1. 121 ft^2　　　2. 564 ft^2

3. Divide the perimeter by 4 and square the quotient.

Problem Solving

1. 7.7 ft　　　　2. 351 mm^2

3. 28.2 cm　　　4. $10\dfrac{1}{4}$ ft

5. A　　　　　　6. G

7. B

Reading Strategies

1. $\dfrac{2}{x} = \dfrac{x}{9}$　　　2. $x^2 = 18$

3. $x \approx 4.2$　　　4. Add $8 + 15$.

5. $y^2 = 345$　　　6. $y \approx 18.6$