Trigonometry: 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes.

Section A: Consolidating (Questions 1-4)

Question 1

Triangle PQR has a right angle at Q. The side lengths are PQ = 6 cm, QR = 8 cm and PR = 10 cm.

For the angle at R, name and give the length of:

(a) the hypotenuse

(b) the opposite side

(c) the adjacent side

Question 2

Use triangle PQR from Question 1. Write each ratio as a fraction in simplest form.

(a) sin R

(b) cos R

(c) tan R

Question 3

Use your calculator (in degree mode) to find each value correct to 4 decimal places.

(a) sin 30°

(b) cos 60°

(c) tan 45°

(d) sin 72°

Question 4

Fill in each box with "opposite", "adjacent" or "hypotenuse" for an angle θ in a right-angled triangle.

(a) sin θ = (□)/(hypotenuse)

(b) cos θ = (adjacent)/(□)

(c) $\tan\theta = (\square)/(\square)$

Section B: Standard (Questions 5-10)

Question 5

Three right-angled triangles each contain the same acute angle θ. For each triangle, the side opposite θ, the side adjacent to θ and the hypotenuse are given.

Triangle	Opposite	Adjacent	Hypotenuse	opposite/hy	adjacent/hy	opposite/ad
A	3 cm	4 cm	5 cm			
B	6 cm	8 cm	10 cm			
C	15 cm	20 cm	25 cm			

(a) Complete the table, writing each ratio as a decimal.

(b) What do you notice about each ratio across the three triangles?

(c) Explain, using similar triangles, why this happens.

Question 6

Triangle ABC has a right angle at B and angle A = 40°. Triangle DEF has a right angle at E and angle D = 40°. Triangle DEF is much larger than triangle ABC.

(a) Explain why the two triangles are similar.

(b) Explain why BC/AB = EF/DE, and say which trigonometric ratio of 40° this fraction equals.

Question 7

Rosa knows that $\sin 30° = 0.5$. Without measuring, find the length of the side opposite the 30° angle in each right-angled triangle.

(a) The hypotenuse is 12 cm.

(b) The hypotenuse is 20 cm.

(c) The hypotenuse is 7 cm.

Question 8

A right-angled triangle has an angle of 35° and a hypotenuse of 20 cm. The side opposite the 35° angle is x cm.

Find x, correct to 1 decimal place.

Question 9

A right-angled triangle has an angle of 52°. The side adjacent to this angle is 15 m long. The side opposite the 52° angle is y m.

Find y, correct to 1 decimal place.

Question 10

A right-angled triangle has an angle of 28° and a hypotenuse of 40 cm. The side adjacent to the 28° angle is w cm.

Find w, correct to 1 decimal place.

Trigonometry: answers

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Question 1

Answer: (a) PR = 10 cm (b) PQ = 6 cm (c) QR = 8 cm

Question 2

Answer: (a) ⅗ (b) ⅘ (c) ¾

Question 3

Answer: (a) 0.5000 (b) 0.5000 (c) 1.0000 (d) 0.9511

Question 4

Answer: (a) opposite (b) hypotenuse (c) opposite/adjacent

Question 5

Answer: (a) Every row: 0.6, 0.8, 0.75 (b) Each ratio is the same in all three triangles. (c) The triangles have the same angles (90°, θ and the third angle), so they are similar; their sides are in the same proportion, so the ratio of any two corresponding sides stays the same.

Question 6

Answer: (a) Both have angles 90°, 40° and 50° (equiangular, AA), so they are similar. (b) In similar triangles corresponding sides are in the same ratio, so opposite over adjacent is equal in both; this is tan 40°.

Question 7

Answer: (a) 6 cm (b) 10 cm (c) 3.5 cm (opposite = 0.5 × hypotenuse)

Question 8

Answer: x ≈ 11.5 (x = 20 sin 35°)

Question 9

Answer: y ≈ 19.2 (y = 15 tan 52°)

Question 10

Answer: w ≈ 35.3 (w = 40 cos 28°)