Regents Exam Questions G.SRT.C.8: Using Trigonometry to Find a Side 1

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1 In right triangle *ABC* below, $m\angle C = 90^\circ$, AC = 12, and $m\angle A = 25^\circ$.



Which equation is correct for $\triangle ABC$?

$$1) \quad a = \frac{12}{\tan 25^{\circ}}$$

2)
$$a = 12 \tan 25^{\circ}$$

3)
$$c = \frac{12}{\tan 25^{\circ}}$$

4)
$$c = 12 \tan 25^{\circ}$$

2 Given the right triangle in the diagram below, what is the value of *x*, to the *nearest foot*?



- 1) 11
- 2) 17
- 3) 18
- 4) 22

3 A vertical mine shaft is modeled in the diagram below. At a point on the ground 50 feet from the top of the mine, a ventilation tunnel is dug at an angle of 47°.



What is the length of the tunnel, to the *nearest foot*?

- 1) 47
- 2) 54
- 3) 68
- 4) 73
- 4 As shown in the diagram below, the angle of elevation from a point on the ground to the top of the tree is 34°.



If the point is 20 feet from the base of the tree, what is the height of the tree, to the *nearest tenth of a foot*?

- 1) 29.7
- 2) 16.6
- 3) 13.5
- 4) 11.2

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5 A tipping platform is a ramp used to unload trucks, as shown in the diagram below.



The truck is on a 75-foot-long ramp. The ramp is tipped at an angle of 30° . What is the height of the upper end of the ramp, *x*, to the *nearest tenth of a foot*?

- 1) 68.7
- 2) 65.0
- 3) 43.3
- 4) 37.5
- 6 A man was parasailing above a lake at an angle of elevation of 32° from a boat, as modeled in the diagram below.



If 129.5 meters of cable connected the boat to the parasail, approximately how many meters above the lake was the man?

- 1) 68.6
- 2) 80.9
- 3) 109.8
- 4) 244.4

7 Yolanda is making a springboard to use for gymnastics. She has 8-inch-tall springs and wants to form a 16.5° angle with the base, as modeled in the diagram below.



To the *nearest tenth of an inch*, what will be the length of the springboard, *x*?

- 1) 2.3
- 2) 8.3
- 3) 27.0
- 4) 28.2
- 8 The diagram below shows a tree growing vertically on a hillside. The angle formed by the tree trunk and the hillside is 100°. The distance from the base of the tree to the bottom of the hill is 140 feet.



What is the vertical drop, *x*, to the base of the hill, to the *nearest foot*?

- 1) 24
- 2) 25
- 3) 70
- 4) 138

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9 The diagram below shows two similar triangles.



If $\tan \theta = \frac{3}{7}$, what is the value of *x*, to the *nearest* tenth?

- 1) 1.2
- 5.6 2)
- 7.6
- 3)
- 4) 8.8
- 10 Triangle ABC has a right angle at C. If AC = 7.7and $m \angle B = 24^\circ$, what is AB, to the nearest tenth?
 - 1) 18.9
 - 2) 17.3
 - 3) 8.4
 - 4) 3.1
- 11 In right triangle *ABC*, $m \angle A = 90^\circ$, $m \angle B = 18^\circ$, and AC = 8. To the *nearest tenth*, the length of BC is
 - 1) 2.5
 - 2) 8.4
 - 3) 24.6
 - 4) 25.9
- 12 In right triangle ABC, $m \angle A = 32^\circ$, $m \angle B = 90^\circ$, and AC = 6.2 cm. What is the length of BC, to the nearest tenth of a centimeter?
 - 1) 3.3
 - 2) 3.9
 - 3) 5.3
 - 11.7 4)
- 13 A 20-foot support post leans against a wall, making a 70° angle with the ground. To the nearest tenth of a foot, how far up the wall will the support post reach?
 - 1) 6.8
 - 6.9 2)
 - 18.7 3)
 - 4) 18.8

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- 14 A ladder 20 feet long leans against a building, forming an angle of 71° with the level ground. To the nearest foot, how high up the wall of the building does the ladder touch the building?
 - 1) 15
 - 2) 16
 - 3) 18
 - 4) 19
- A 15-foot ladder leans against a wall and makes an 15 angle of 65° with the ground. What is the horizontal distance from the wall to the base of the ladder, to the nearest tenth of a foot?
 - 1) 6.3
 - 2) 7.0
 - 3) 12.9
 - 4) 13.6
- 16 Chelsea is sitting 8 feet from the foot of a tree. From where she is sitting, the angle of elevation of her line of sight to the top of the tree is 36° . If her line of sight starts 1.5 feet above ground, how tall is the tree, to the *nearest foot*?
 - 8 1)
 - 2) 7
 - 3) 6
 - 4) 4
- 17 From a point on the ground one-half mile from the base of a historic monument, the angle of elevation to its top is 11.87°. To the *nearest foot*, what is the height of the monument?
 - 1) 543
 - 2) 555
 - 3) 1086
 - 4) 1110
- 18 In rectangle *ABCD*, diagonal \overline{AC} is drawn. The measure of $\angle ACD$ is 37° and the length of BC is 7.6 cm. What is the length of AC, to the *nearest* tenth of a centimeter?
 - 4.6 1)
 - 2) 9.5
 - 10.1 3)
 - 4) 12.6

G.SRT.C.8: Using Trigonometry to Find a Side 1 Answer Section

1 ANS: 2 $\tan 25^\circ = \frac{a}{12}$ REF: 082409geo 2 ANS: 3 $\cos 40 = \frac{14}{x}$ $x \approx 18$ REF: 011712geo 3 ANS: 4 $\cos 47 = \frac{50}{x}$ $x \approx 73$ REF: 012406geo 4 ANS: 3 $\tan 34 = \frac{T}{20}$ $T \approx 13.5$ REF: 061505geo 5 ANS: 4 $\sin 30 = \frac{x}{75}$ *x* = 37.5 REF: 012411geo 6 ANS: 1 $\sin 32 = \frac{O}{129.5}$ $O \approx 68.6$ REF: 011804geo 7 ANS: 4 $\sin 16.5 = \frac{8}{x}$ $x \approx 28.2$ REF: 081806ai

8 ANS: 1 $\sin 10 = \frac{x}{140}$ $x \approx 24$ REF: 062217geo 9 ANS: 2 $\tan \theta = \frac{2.4}{x}$ $\frac{3}{7} = \frac{2.4}{x}$ *x* = 5.6 REF: 011707geo 10 ANS: 1 $\sin 24 = \frac{7.7}{x}$ $x \approx 18.9$ REF: 012504geo 11 ANS: 4 $\sin 18 = \frac{8}{x}$ $x \approx 25.9$ REF: 062316geo 12 ANS: 1 $\sin 32 = \frac{x}{6.2}$ $x \approx 3.3$ REF: 081719geo 13 ANS: 4 $\sin 70 = \frac{x}{20}$ $x\approx 18.8$ REF: 061611geo 14 ANS: 4 $\sin 71 = \frac{x}{20}$ $x = 20\sin 71 \approx 19$ REF: 061721geo

15 ANS: 1 $\cos 65 = \frac{x}{15}$ $x \approx 6.3$ REF: 081924geo 16 ANS: 2 $\tan 36 = \frac{x}{8}$ 5.8 + 1.5 \approx 7 $x \approx 5.8$ REF: 081915geo 17 ANS: 2 $\tan 11.87 = \frac{x}{0.5(5280)}$ $x \approx 555$ REF: 011913geo 18 ANS: 4 $\sin 37 = \frac{7.6}{x}$ $x \approx 12.6$

REF: 062412geo