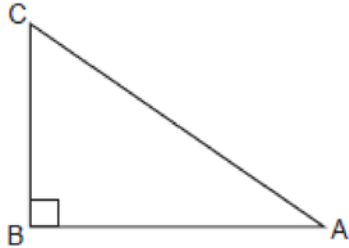


**G.SRT.C.8: Using Trigonometry to Find an Angle 1a**

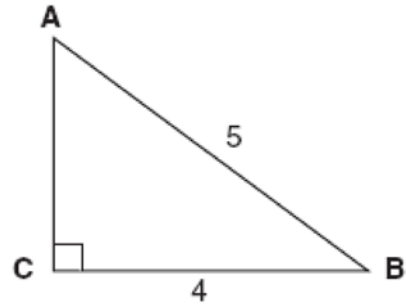
- 1 Cassandra is calculating the measure of angle  $A$  in right triangle  $ABC$ , as shown in the accompanying diagram. She knows the lengths of  $\overline{AB}$  and  $\overline{BC}$ .



If she finds the measure of angle  $A$  by solving only one equation, which concept will be used in her calculations?

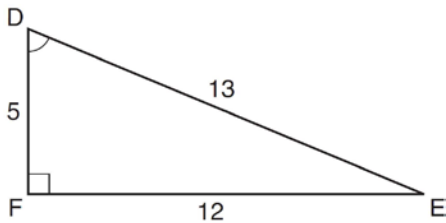
- 1) Pythagorean theorem
- 2)  $\sin A$
- 3)  $\cos A$
- 4)  $\tan A$

- 3 Which equation could be used to find the measure of one acute angle in the right triangle shown below?



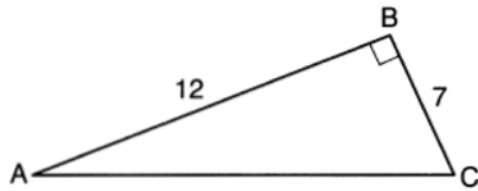
- 1)  $\sin A = \frac{4}{5}$
- 2)  $\tan A = \frac{5}{4}$
- 3)  $\cos B = \frac{5}{4}$
- 4)  $\tan B = \frac{4}{5}$

- 2 Which equation could be used to find the measure of angle  $D$  in the right triangle shown in the diagram below?



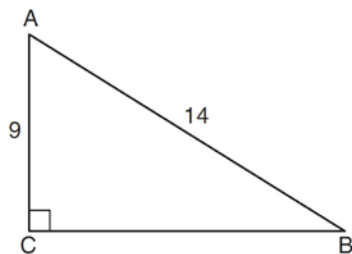
- 1)  $\cos D = \frac{12}{13}$
- 2)  $\cos D = \frac{13}{12}$
- 3)  $\sin D = \frac{5}{13}$
- 4)  $\sin D = \frac{12}{13}$

- 4 Which equation could be used to find the measure of one acute angle in the right triangle shown below?



- 1)  $\tan A = \frac{7}{12}$
- 2)  $\tan A = \frac{12}{7}$
- 3)  $\sin C = \frac{12}{7}$
- 4)  $\cos A = \frac{7}{12}$

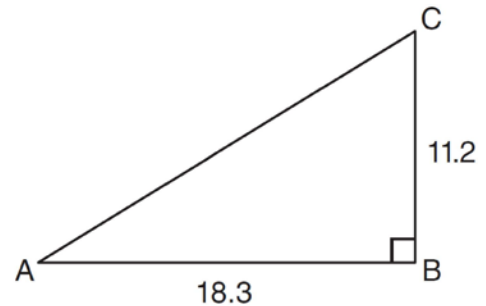
- 5 In the diagram of right triangle  $ABC$  shown below,  $AB = 14$  and  $AC = 9$ .



What is the measure of  $\angle A$ , to the nearest degree?

- 1) 33
- 2) 40
- 3) 50
- 4) 57

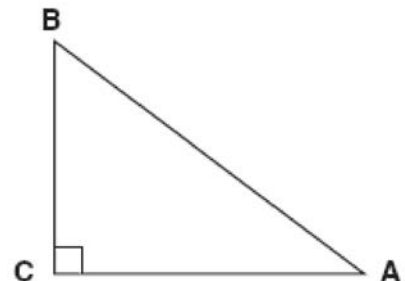
- 6 In right triangle  $ABC$  shown below,  $AB = 18.3$  and  $BC = 11.2$ .



What is the measure of  $\angle A$ , to the nearest tenth of a degree?

- 1) 31.5
- 2) 37.7
- 3) 52.3
- 4) 58.5

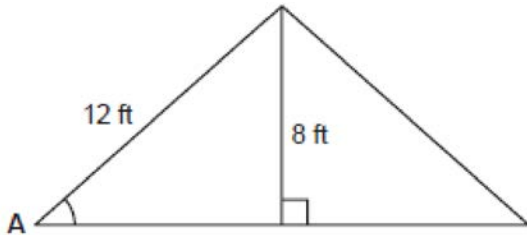
- 7 In the diagram of  $\triangle ABC$  shown below,  $BC = 10$  and  $AB = 16$ .



To the nearest tenth of a degree, what is the measure of the largest acute angle in the triangle?

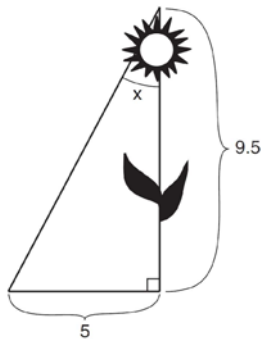
- 1) 32.0
- 2) 38.7
- 3) 51.3
- 4) 90.0

- 8 The center pole of a tent is 8 feet long, and a side of the tent is 12 feet long as shown in the diagram below.



If a right angle is formed where the center pole meets the ground, what is the measure of angle  $A$  to the nearest degree?

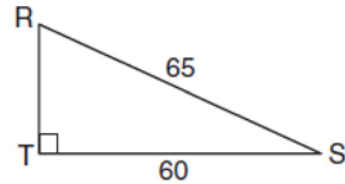
- 1) 34
  - 2) 42
  - 3) 48
  - 4) 56
- 9 The diagram below shows the path a bird flies from the top of a 9.5-foot-tall sunflower to a point on the ground 5 feet from the base of the sunflower.



To the nearest tenth of a degree, what is the measure of angle  $x$ ?

- 1) 27.8
- 2) 31.8
- 3) 58.2
- 4) 62.2

- 10 In the diagram of  $\triangle RST$  below,  $m\angle T = 90^\circ$ ,  $RS = 65$ , and  $ST = 60$ .



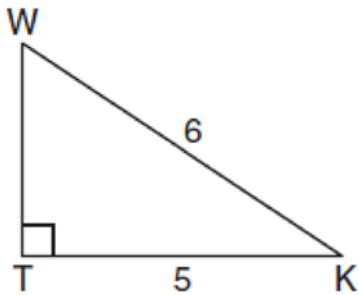
What is the measure of  $\angle S$ , to the nearest degree?

- 1)  $23^\circ$
  - 2)  $43^\circ$
  - 3)  $47^\circ$
  - 4)  $67^\circ$
- 11 In right triangle  $EFD$ ,  $ED = 11$ ,  $EF = 6$ , and  $m\angle F = 90$ . What is the measure of angle  $E$ , to the nearest degree?
- 1) 61
  - 2) 57
  - 3) 33
  - 4) 29
- 12 If a tree 28 meters tall casts a shadow 32 meters long, what is the angle of elevation of the Sun to the nearest degree?
- 1) 29
  - 2) 41
  - 3) 50
  - 4) 61

- 13 A man who is 5 feet 9 inches tall casts a shadow of 8 feet 6 inches. Assuming that the man is standing perpendicular to the ground, what is the angle of elevation from the end of the shadow to the top of the man's head, to the *nearest tenth of a degree*?

- 1) 34.1
- 2) 34.5
- 3) 42.6
- 4) 55.9

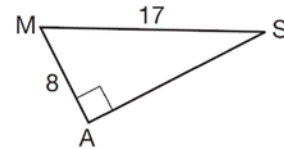
- 14 In the diagram below of right triangle  $KTW$ ,  $KW = 6$ ,  $KT = 5$ , and  $m\angle KTW = 90$ .



What is the measure of  $\angle K$ , to the *nearest minute*?

- 1)  $33^\circ 33'$
- 2)  $33^\circ 34'$
- 3)  $33^\circ 55'$
- 4)  $33^\circ 56'$

- 15 In the right triangle shown below, what is the measure of angle  $S$ , to the *nearest minute*?



- 1)  $28^\circ 1'$
- 2)  $28^\circ 4'$
- 3)  $61^\circ 56'$
- 4)  $61^\circ 93'$

- 16 A support wire 20 meters long runs from the top of a utility pole to a point on the ground 17 meters from the base of the pole. What is the measure, to the *nearest minute*, of the angle formed by the pole and the wire?

- 1)  $31^\circ 47'$
- 2)  $31^\circ 48'$
- 3)  $58^\circ 12'$
- 4)  $58^\circ 13'$

**G.SRT.C.8: Using Trigonometry to Find an Angle 1a**  
**Answer Section**

1 ANS: 4 REF: 060820a

2 ANS: 4

$$\sin D = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{12}{13}$$

REF: 061325ia

3 ANS: 1 REF: 080824ia

4 ANS: 1

$$\tan A = \frac{\text{opposite}}{\text{adjacent}} = \frac{7}{12}$$

REF: 061619ia

5 ANS: 3

$$\cos A = \frac{9}{14}$$

$$A \approx 50^\circ$$

REF: 011616geo

6 ANS: 1 REF: 061114ia

7 ANS: 3

$$\sin A = \frac{10}{16} \quad B = 180 - (90 + 38.7) = 51.3. \quad \text{A } 90^\circ \text{ angle is not acute.}$$

$$A \approx 38.7$$

REF: 080829ia

8 ANS: 2

$$\sin A = \frac{8}{12}$$

$$A \approx 42$$

REF: 060816ia

9 ANS: 1

$$\tan x = \frac{5}{9.5}$$

$$x \approx 27.8$$

REF: 011525ia

10 ANS: 1

$$\cos S = \frac{60}{65}$$

$$S \approx 23$$

REF: 061713geo

11 ANS: 2

$$\cos E = \frac{6}{11}$$

$$E \approx 57$$

REF: 061523ia

12 ANS: 2

REF: 068533siii

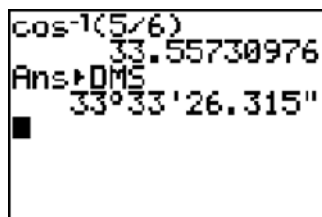
13 ANS: 1

The man's height, 69 inches, is opposite to the angle of elevation, and the shadow length, 102 inches, is adjacent to the angle of elevation. Therefore, tangent must be used to find the angle of elevation.  $\tan x = \frac{69}{102}$

$$x \approx 34.1$$

REF: fall1401geo

14 ANS: 1



A calculator display showing the calculation of the inverse cosine of 5/6. The screen displays: cos⁻¹(5/6), 33.55730976, Ans → DMS, 33°33'26.315".

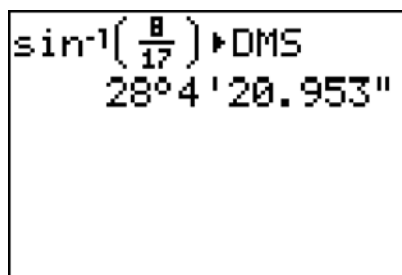
$$\cos K = \frac{5}{6}$$

$$K = \cos^{-1} \frac{5}{6}$$

$$K \approx 33^{\circ}33'$$

REF: 061023a2

15 ANS: 2



$$\sin^{-1}\left(\frac{8}{17}\right) \text{ DMS}$$

$$28^{\circ}4'20.953''$$

$$\sin S = \frac{8}{17}$$

$$S = \sin^{-1} \frac{8}{17}$$

$$S \approx 28^{\circ}4'$$

REF: 061311a2

16 ANS: 4

$$\sin^{-1} \frac{17}{20} \approx 58.21^{\circ} \quad 0.21 \cdot 60 = 12.6$$

REF: 011725a2