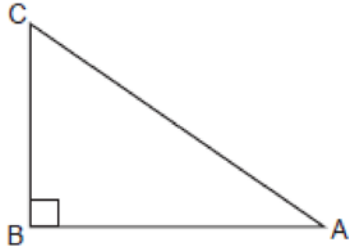


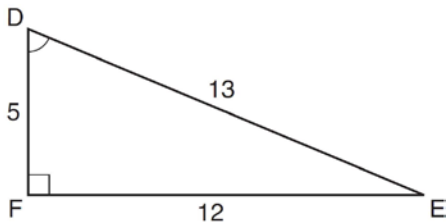
G.SRT.C.8: Using Trigonometry to Find an Angle 1b

- 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} ,

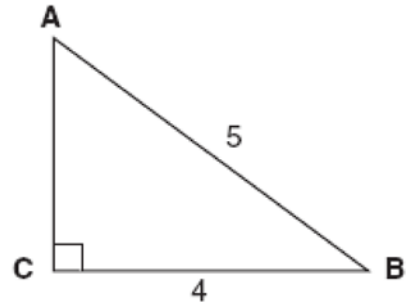


If she finds the measure of angle A by solving only one equation, which concept will be used in her calculations?

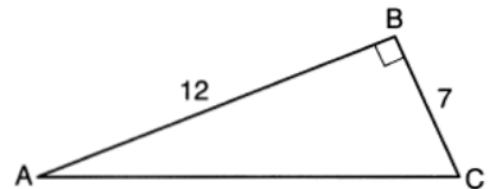
- 2 Which equation could be used to find the measure of angle D in the right triangle shown in the diagram below?



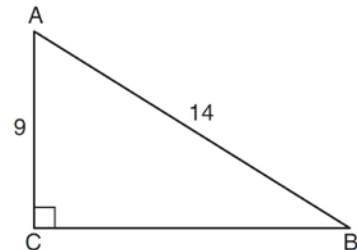
- 3 Which equation could be used to find the measure of one acute angle in the right triangle shown below?



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

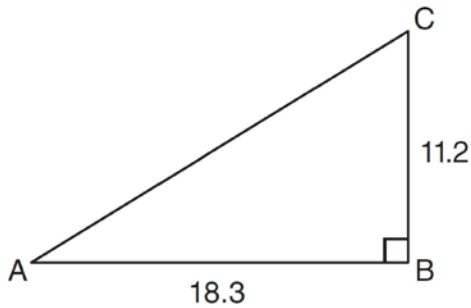


- 5 In the diagram of right triangle ABC shown below, $AB = 14$ and $AC = 9$.



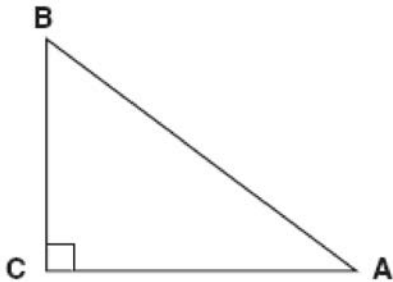
What is the measure of $\angle A$, to the nearest degree?

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



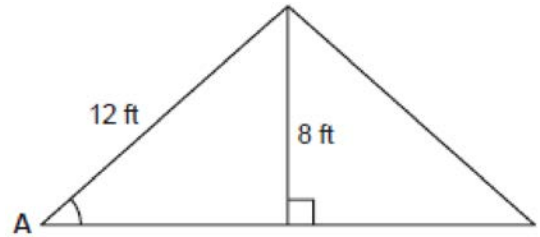
What is the measure of $\angle A$, to the *nearest tenth of a degree*?

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



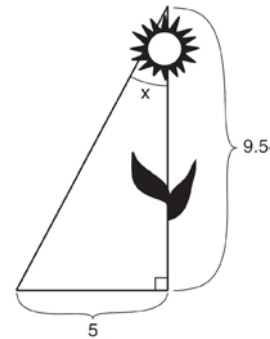
To the *nearest tenth of a degree*, what is the measure of the largest acute angle in the triangle?

- 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.



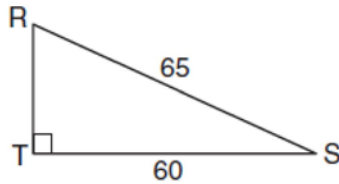
If a right angle is formed where the center pole meets the ground, what is the measure of angle A to the *nearest degree*?

- 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.



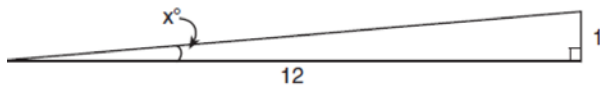
To the *nearest tenth of a degree*, what is the measure of angle x ?

- 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*?

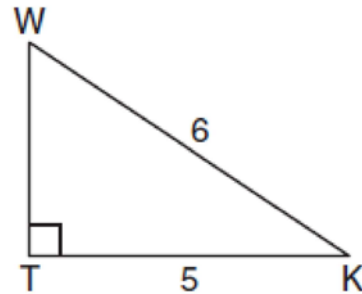
- 11 To build a handicapped-access ramp, the building code states that for every 1 inch of vertical rise in height, the ramp must extend out 12 inches horizontally, as shown in the diagram below.



What is the angle of inclination, x , of this ramp, to the *nearest hundredth of a degree*?

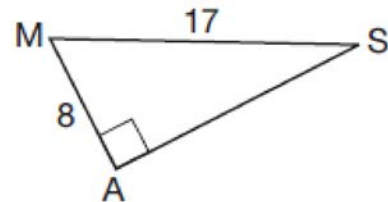
- 12 In right triangle EFD , $ED = 11$, $EF = 6$, and $m\angle F = 90$. What is the measure of angle E , to the *nearest degree*?
- 13 If a tree 28 meters tall casts a shadow 32 meters long, what is the angle of elevation of the Sun to the *nearest degree*?
- 14 A man who is 5 feet 9 inches tall casts 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*?

- 15 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*?

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



- 17 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?

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

1 ANS:
 $\tan A$

REF: 060820a

2 ANS:

$$\sin D = \frac{12}{13}$$

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

REF: 061325ia

3 ANS:

$$\sin A = \frac{4}{5}$$

REF: 080824ia

4 ANS:

$$\tan A = \frac{7}{12}$$

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

REF: 061619ia

5 ANS:
 50

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

$$A \approx 50^\circ$$

REF: 011616geo

6 ANS:
 31.5

REF: 061114ia

7 ANS:
 51.3

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

$$A \approx 38.7$$

REF: 080829ia

8 ANS:
42

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

$$A \approx 42$$

REF: 060816ia

9 ANS:
27.8

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

$$x \approx 27.8$$

REF: 011525ia

10 ANS:
23°

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

$$S \approx 23$$

REF: 061713geo

11 ANS:
4.76

$$\tan x = \frac{1}{12}$$

$$x \approx 4.76$$

REF: 081715geo

12 ANS:
57

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

$$E \approx 57$$

REF: 061523ia

13 ANS:
41

REF: 068533siii

14 ANS:

34.1

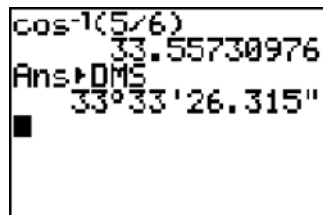
The man's height, 69 inches, is opposite to the angle of elevation, and the shadow length, 102 inches, is adjacent to the angle of elevation. Therefore, tangent must be used to find the angle of elevation. $\tan x = \frac{69}{102}$

$$x \approx 34.1$$

REF: fall1401geo

15 ANS:

33°33'



A calculator screen showing the calculation of the inverse cosine of 5/6. The display shows: $\cos^{-1}(5/6)$, 33.55730976 , $\text{Ans} \rightarrow \text{DMS}$, and $33^\circ 33' 26.315''$.

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

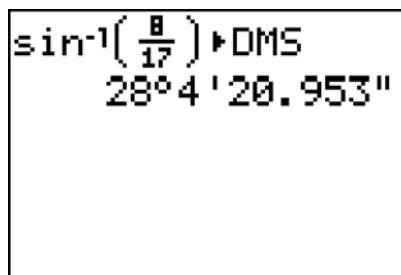
$$K = \cos^{-1} \frac{5}{6}$$

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

REF: 061023a2

16 ANS:

28°4'



A calculator screen showing the calculation of the inverse sine of 8/17. The display shows: $\sin^{-1}(\frac{8}{17}) \rightarrow \text{DMS}$ and $28^\circ 4' 20.953''$.

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

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

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

REF: 061311a2

17 ANS:

58°13'

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

REF: 011725a2