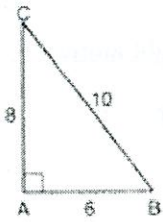


1.

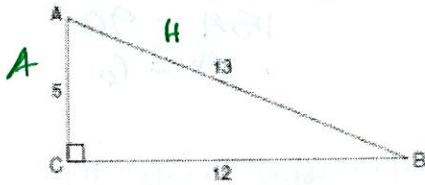


Which ratio represents the sine of $\angle B$?

- 1) $\frac{10}{8}$
- 2) $\frac{8}{6}$
- 3) $\frac{6}{10}$
- 4) $\frac{8}{10}$

2.

Which ratio represents $\cos A$ in the accompanying diagram of $\triangle ABC$?



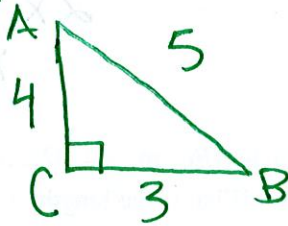
- 1) $\frac{5}{13}$
- 2) $\frac{12}{13}$
- 3) $\frac{12}{5}$
- 4) $\frac{13}{5}$

$\cos A = \frac{A}{H}$
 $\frac{5}{13}$

3.

In $\triangle ABC$, $m\angle C = 90^\circ$. If $AB = 5$ and $AC = 4$, which statement is not true?

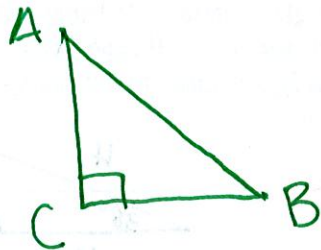
- 1) $\cos A = \frac{4}{5}$ ✓
- 2) $\tan A = \frac{3}{4}$ ✓
- 3) $\sin B = \frac{4}{5}$ ✓
- 4) $\tan B = \frac{5}{3}$ ✗



4.

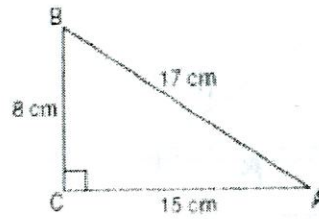
In right triangle ABC , $m\angle C = 90^\circ$ and $AC \neq BC$. Which trigonometric ratio is equivalent to $\sin B$?

- 1) $\cos A$
- 2) $\cos B$
- 3) $\tan A$ ✗
- 4) $\tan B$ ✗



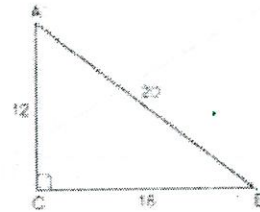
5.

Which equation shows a correct trigonometric ratio for angle A in the right triangle below?



- 1) $\sin A = \frac{15}{17}$
- 2) $\tan A = \frac{8}{17}$
- 3) $\cos A = \frac{15}{17}$
- 4) $\tan A = \frac{5}{8}$

6.

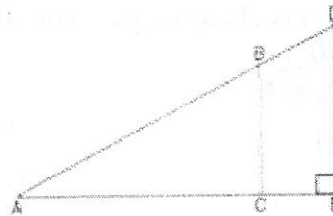


Which equation is not correct?

- 1) $\cos A = \frac{12}{20}$ ✓
- 2) $\tan A = \frac{16}{12}$ ✓
- 3) $\sin B = \frac{12}{20}$ ✓
- 4) $\tan B = \frac{16}{20}$ ✗

7.

In the diagram of right triangle ADE below, $\overline{BC} \parallel \overline{DE}$.



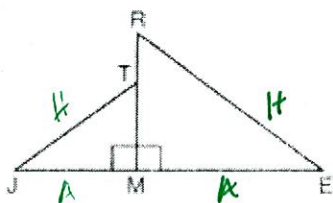
Which ratio is always equivalent to the sine of $\angle A$?

- 1) $\frac{AD}{DE}$
- 2) $\frac{AE}{AD}$
- 3) $\frac{BC}{AB}$
- 4) $\frac{AB}{AC}$

$\frac{DE}{AD}$

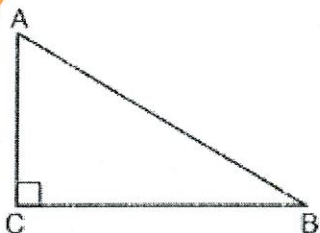
$\frac{BC}{AB}$

8. In the diagram below, $\triangle ERM \sim \triangle JTM$.



Which statement is always true?

- 1) $\cos J = \frac{RM}{RE}$
- 2) $\cos R = \frac{JM}{JT}$
- 3) $\tan T = \frac{RM}{EM}$
- 4) $\tan E = \frac{JM}{JM}$



9. Which equation is always true?

- 1) $\sin A = \sin B$
- 2) $\cos A = \cos B$
- 3) $\cos A = \sin C$
- 4) $\sin A = \cos B$

10. In $\triangle ABC$, the complement of $\angle B$ is $\angle A$. Which statement is always true?

- 1) $\tan \angle A = \tan \angle B$
- 2) $\sin \angle A = \sin \angle B$
- 3) $\cos \angle A = \tan \angle B$
- 4) $\sin \angle A = \cos \angle B$

11. Which expression is always equivalent to $\sin x$ when $0^\circ < x < 90^\circ$?

- 1) $\cos(90^\circ - x)$
- 2) $\cos(45^\circ - x)$
- 3) $\cos(2x)$
- 4) $\cos x$

12. In right triangle ABC , $m\angle C = 90^\circ$. If $\cos B = \frac{5}{13}$,

which function also equals $\frac{5}{13}$?

- 1) $\tan A$
- 2) $\tan B$
- 3) $\sin A$
- 4) $\sin B$

13. In $\triangle ABC$, where $\angle C$ is a right angle,

$\cos A = \frac{\sqrt{21}}{5}$. What is $\sin B$?

- 1) $\frac{\sqrt{21}}{5}$
- 2) $\frac{\sqrt{21}}{2}$
- 3) $\frac{2}{5}$
- 4) $\frac{5}{\sqrt{21}}$

14. If $\sin 6A = \cos 9A$, then $m\angle A$ is equal to

- 1) 6
- 2) 36
- 3) 45
- 4) $1\frac{1}{2}$

$$\begin{aligned} 6A + 9A &= 90 \\ 15A &= 90 \\ A &= 6 \end{aligned}$$

15. Which is a value of x if $\sin 60^\circ = \cos(x + 10)^\circ$?

- 1) 10°
- 2) 20°
- 3) 50°
- 4) 60°

$$\begin{aligned} 90 - 60 &= 30 \\ 30 &= x + 10 \end{aligned}$$

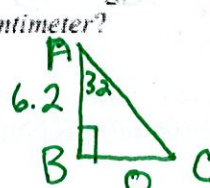
16. In a right triangle, the acute angles have the relationship $\sin(2x + 4) = \cos(46)$. What is the value of x ?

- 1) 20
- 2) 21
- 3) 24
- 4) 25

$$\begin{aligned} 90 - 46 &= 44 \\ 2x + 4 &= 44 \\ x &= 20 \end{aligned}$$

17. In right triangle ABC , $m\angle A = 32^\circ$, $m\angle B = 90^\circ$, and $AE = 6.2$ cm. What is the length of BC , to the nearest tenth of a centimeter?

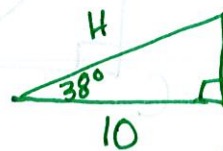
- 1) 3.3
- 2) 3.9
- 3) 5.3
- 4) 11.7



$$\tan 32 = \frac{BC}{6.2}$$

18. A right triangle contains a 38° angle whose adjacent side measures 10 centimeters. What is the length of the hypotenuse, to the nearest hundredth of a centimeter?

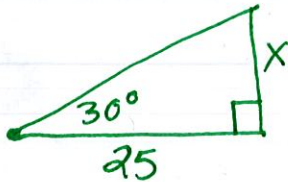
- 1) 7.88
- 2) 12.69
- 3) 12.80
- 4) 16.24



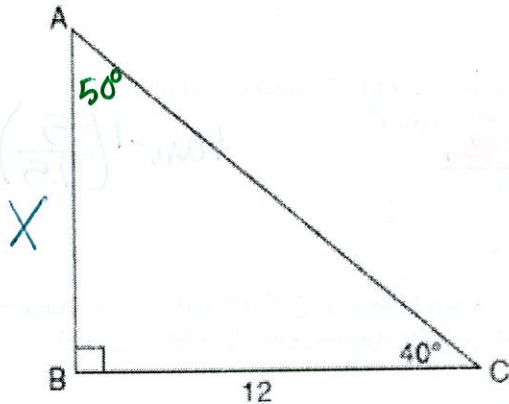
$$\cos(38) = \frac{10}{H}$$

19. The angle of elevation from a point 25 feet from the base of a tree on level ground to the top of the tree is 30° . Which equation can be used to find the height of the tree?

- 1) $\tan 30^\circ = \frac{x}{25}$
- 2) $\sin 30^\circ = \frac{x}{25}$
- 3) $\cos 30^\circ = \frac{x}{25}$
- 4) $30^2 + 25^2 = x^2$



$\tan 30^\circ = \frac{x}{25}$

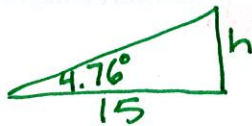


20. Which single function could be used to find AB?

- 1) $\tan 50$
- 2) $\sin 50^\circ$
- 3) $\cos 40$
- 4) $\sin 40$

21. By law, a wheelchair service ramp may be inclined no more than 4.76° . If the base of a ramp begins 15 feet from the base of a public building, which equation could be used to determine the maximum height, h , of the ramp where it reaches the building's entrance?

- 1) $\sin 4.76^\circ = \frac{h}{15}$
- 2) $\sin 4.76^\circ = \frac{15}{h}$
- 3) $\tan 4.76^\circ = \frac{h}{15}$
- 4) $\tan 4.76^\circ = \frac{15}{h}$



$\tan 4.76^\circ = \frac{h}{15}$

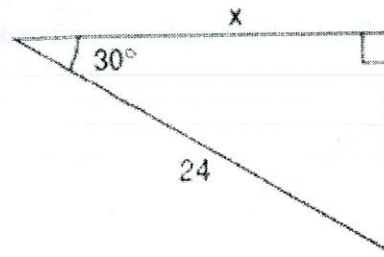
22. From a point on the ground one-half mile from the base of a historic monument, the angle of elevation to its top is 11.87° . To the nearest foot, what is the height of the monument? 1 mile = 5,280 ft

- 1) 543
- 2) 555
- 3) 1086
- 4) 1110



$\tan 11.87^\circ = \frac{h}{2640}$

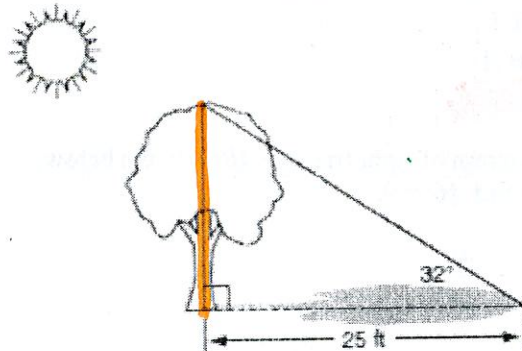
23. In the right triangle shown in the diagram below, what is the value of x to the nearest whole number?



$\cos(30^\circ) = \frac{x}{24}$

- 1) 12
- 2) 14
- 3) 21
- 4) 28

24. A tree casts a 25-foot shadow on a sunny day, as shown in the diagram below.



25. If the angle of elevation from the tip of the shadow to the top of the tree is 32° , what is the height of the tree to the nearest tenth of a foot?

- 1) 13.2
- 2) 15.6
- 3) 21.2
- 4) 40.0

$\tan 32^\circ = \frac{x}{25}$

26. 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?

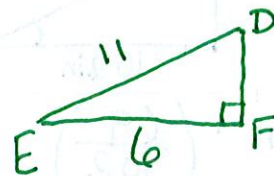
- 1) 6.8
- 2) 6.9
- 3) 18.7
- 4) 18.8



$\sin(70^\circ) = \frac{x}{20}$

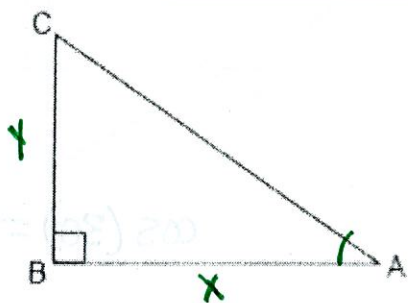
27. In right triangle EFD , $ED = 11$, $EF = 6$, and $m\angle F = 90^\circ$. What is the measure of angle E , to the nearest degree?

- 1) 61
- 2) 57
- 3) 33
- 4) 29



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

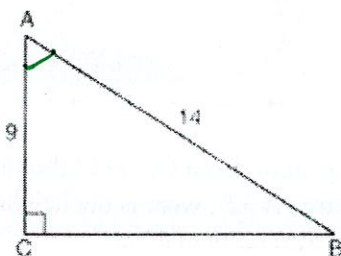
28. Cassandra is calculating the measure of angle A in right triangle ABC , as shown in the accompanying diagram. She knows the lengths of AB and BC .



29. 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) $\tan A$

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



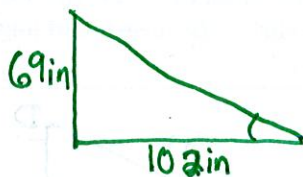
What is the measure of $\angle A$, to the nearest degree?

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

$\cos^{-1}\left(\frac{9}{14}\right)$

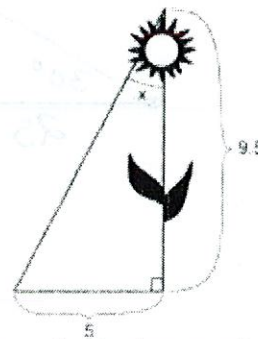
31. A man who is 5 feet 9 inches tall casts a shadow of 8 feet 6 inches. Assuming that the man is standing perpendicular to the ground, what is the angle of elevation from the end of the shadow to the top of the man's head, to the nearest tenth of a degree?

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



$\tan^{-1}\left(\frac{69}{102}\right)$

32. 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.



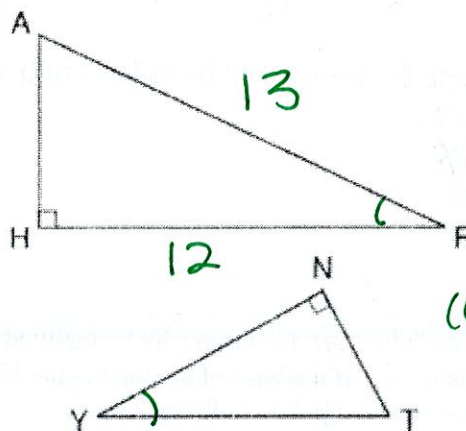
33. To the nearest tenth of a degree, what is the measure of angle x ?

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

$\tan^{-1}\left(\frac{5}{9.5}\right)$

In the diagram below of $\triangle HAR$ and $\triangle NTY$, angles H and N are right angles, and $\triangle HAR \sim \triangle NTY$.

34.

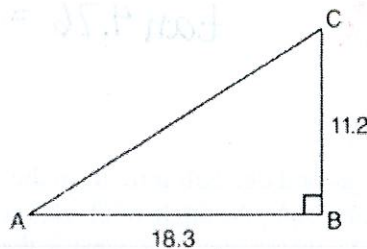


$\cos^{-1}\left(\frac{12}{13}\right)$

If $AR = 13$ and $HR = 12$, what is the measure of angle Y , to the nearest degree?

- 1) 23°
- 2) 25°
- 3) 65°
- 4) 67°

35.



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

$\tan^{-1}\left(\frac{11.2}{18.3}\right)$