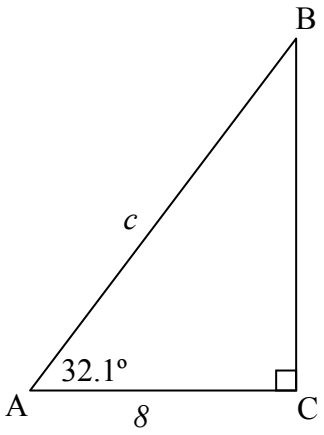
1. Given $\triangle ABC$, find the value of c to the nearest tenth.



A. $c = 10.6$

B. $c = 15.1$

C. $c = 12.4$

D. $c = 12.8$

E. None of the above.

2. Find all solutions of the equation using n as an arbitrary integer.

$$\cot\beta = -\frac{1}{\sqrt{3}}$$

A. $\beta = \frac{5\pi}{6} + \pi n$

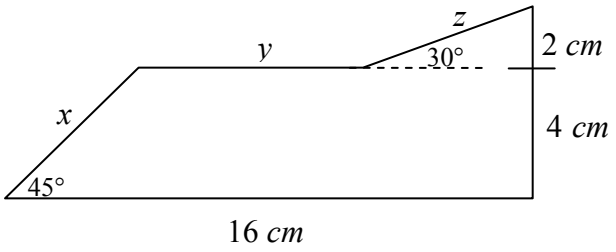
B. $\beta = \frac{\pi}{3} + \pi n$

C. $\beta = \frac{\pi}{6} + \pi n$

D. $\beta = \frac{2\pi}{3} + \pi n$

E. None of the above

3. Find the perimeter of the five-sided figure to the nearest tenth of a centimeter.



A. 40.2 *cm*

B. 38.0 *cm*

C. 41.4 *cm*

D. 43.1 *cm*

E. None of the above

4. A 31 foot ladder leans against the side of a building such that the angle between the ladder and the building is 20°. If the distance from the bottom of the ladder to the building is increased by 3 feet, approximately how far does the top of the ladder move down the building? Please round your answer to the nearest tenth of a foot.

A. 2.8 feet

B. 1.3 feet

C. 6.1 feet

D. 0.9 feet

E. None of the above

5. An airplane, flying at a speed of 300 miles per hour, flies from Point A in the direction 130° for 45 minutes and then flies in the direction 40° for 30 minutes. In what direction does the plane need to fly in order to get back to A? Please round your answer to the nearest whole degree.

A. 270°

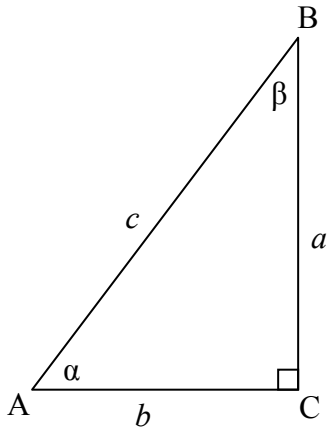
B. 265°

C. 276°

D. 254°

E. None of the above

6. Given ΔABC, express a in terms of β and b.



A. $a = b\tan\beta$

B. $a = b\sec\beta$

C. $a = b\csc\beta$

D. $a = b\sin\beta$

E. $a = b\cot\beta$

7. Find all solutions of the equation using n as an arbitrary integer.

$$\sin\left(2x-\frac{\pi}{4}\right)=1$$

A. $x=\frac{3\pi}{8}+2\pi n,\frac{7\pi}{8}+2\pi n$

B. $x=\frac{3\pi}{8}+\pi n$

C. $x=\frac{3\pi}{8}+\pi n,\frac{7\pi}{8}+\pi n$

D. $x=\frac{3\pi}{8}+2\pi n$

E. None of the above

8. Find all the solutions of the equation that are in the interval $[0,2\pi)$.

$$2\cos^2 t-5\cos t-3=0$$

A. $t=\frac{\pi}{3},\frac{5\pi}{3}$

B. $t=0,\pi$

C. $t=\frac{2\pi}{3},\frac{4\pi}{3}$

D. $t=-\frac{1}{2},3$

E. None of the above

9. Express as a trigonometric function of one angle.

$$\cos 44° \cos 33° - \sin 44° \sin 33°$$

A. $\sin 77°$

B. $\cos 11°$

C. $\sin 11°$

D. $\cos 77°$

E. None of the above

10. Find the exact value of $\sin \frac{\pi}{3} + \sin \frac{\pi}{4}$.

A. $\frac{\sqrt{3} - \sqrt{2}}{2}$

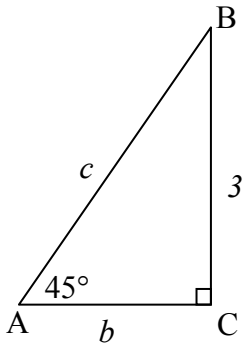
B. $\frac{\sqrt{6} - \sqrt{2}}{4}$

C. $\frac{\sqrt{3} + \sqrt{2}}{2}$

D. $\frac{\sqrt{6} + \sqrt{2}}{4}$

E. None of the above

11. Find the exact value of *b*.



A. 3

B. $3\sqrt{3}$

C. 6

D. $3\sqrt{2}$

E. None of the above

12. If $\cos\alpha = \frac{4}{5}$ and $\cot\beta = \frac{7}{4}$ for a fourth-quadrant angle α and a third-quadrant angle β, find the exact value of $\cos(\alpha+\beta)$.

A. $\frac{16}{5\sqrt{65}}$

B. $\frac{-8}{\sqrt{65}}$

C. $\frac{-16}{5\sqrt{65}}$

D. $\frac{8}{\sqrt{65}}$

E. None of the above

13. Find the exact value of $\tan 2\theta$ if $\cos\theta = -\frac{3}{7}; -270° < \theta < -180°$.

A. $\frac{-12\sqrt{10}}{31}$

B. $\frac{12\sqrt{10}}{49}$

C. $\frac{-12\sqrt{10}}{49}$

D. $\frac{12\sqrt{10}}{31}$

E. None of the above

14. $\dfrac{\sin^2(2\alpha)}{\sin^2\alpha}$ is equivalent to which of the following.

A. $4\cos^2\alpha$

B. 2

C. $2\cos\alpha$

D. $4\sin^2\alpha$

E. $2\sin\alpha$

15. Find the solutions of the equation that are in the interval $[0, 2\pi)$.

$$\cos(2t) - \sin t = 0$$

A. $\dfrac{\pi}{3}, \dfrac{2\pi}{3}, \dfrac{\pi}{2}$

B. $\dfrac{5\pi}{6}, \dfrac{7\pi}{6}, \dfrac{3\pi}{2}$

C. $\dfrac{4\pi}{3}, \dfrac{5\pi}{3}, \dfrac{\pi}{2}$

D. $\dfrac{\pi}{6}, \dfrac{5\pi}{6}, \dfrac{3\pi}{2}$

E. None of the above

Answers

Question	Answer	Letter
1.	$c = 9.4$	E.
2.	$\beta = \frac{2\pi}{3} + \pi n$	D.
3.	$y = 40.2\,cm$	A.
4.	1.3 feet	B.
5.	276°	C.
6.	$a = b\cot\beta$	E.
7.	$x = \frac{3\pi}{8} + \pi n$	B.
8.	$t = \frac{2\pi}{3}, \frac{4\pi}{3}$	C.
9.	$\cos 77°$	D.
10.	$\frac{\sqrt{3}+\sqrt{2}}{2}$	C.
11.	3	A.
12.	$-\frac{8}{\sqrt{65}}$	B.
13.	$\frac{12\sqrt{10}}{31}$	D.
14.	$4\cos^2\alpha$	A.
15.	$\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$	D.