ALBERTA MATH 30-1 · 25 QUESTIONS

Trigonometry — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 The exact value of $\cos\left(\frac{7\pi}{6}\right) + \sin\left(\frac{2\pi}{3}\right)$ is

- **A** 0
- **B** $\frac{\sqrt{3}}{2}$
- **C** $-\frac{\sqrt{3}}{2}$
- **D** 1

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2 **An arc of a circle with radius 12 cm is subtended by a central angle of $\frac{5\pi}{3}$ radians. The length of the arc is**

A 10π cm

B 20π cm

C 40π cm

D 60π cm

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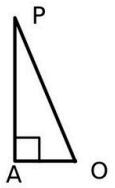
3 **The diagram shows a point P on the terminal arm of an angle θ in standard position. The horizontal side has length 5 and the vertical side has length 12. The exact value of sinθ + cosθ is**



A $\frac{17}{13}$

B $-\frac{7}{13}$

C $\frac{7}{13}$

D $\frac{5}{13}$

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4 The measure of an angle of $\frac{7\pi}{5}$ radians, in degrees, is

- A 126°
- B 252°
- C 504°
- D 140°

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5 The number of solutions to the equation $2\sin^2 x - \sin x - 1 = 0$ on the interval $0 \leq x < 2\pi$ is

- A 1
- B 2
- C 3
- D 4

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6 **An expression equivalent to $\sin^2 x (1 + \cot^2 x)$ is**

A $\tan^2 x$

B $\sin^2 x$

C $\sec^2 x$

D 1

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7 **The graph below shows a sinusoidal function. The maximum value of the function is**

A 4

B 3

C 2

D 5

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8 The exact value of $\csc\left(\frac{4\pi}{3}\right)$ is

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

B $-\frac{2\sqrt{3}}{3}$

C $-\frac{\sqrt{3}}{2}$

D -2

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9 If $\sin\theta = \frac{3}{5}$ and θ is in Quadrant II, then the exact value of $\cos\theta$ is

A $\frac{4}{5}$

B $-\frac{3}{4}$

C $\frac{4}{3}$

D $-\frac{4}{5}$

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10 If $\cos\theta = -\frac{7}{25}$ and θ is in Quadrant III, then $\tan\theta = \frac{a}{b}$ in lowest terms. The value of $a + b$ is

ANSWER _____

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11 The solutions to the equation $\sin(x - \frac{\pi}{3}) = \frac{\sqrt{3}}{2}$ on the interval $0 \leq x < 2\pi$ are

A $x = \frac{\pi}{3}, \frac{2\pi}{3}$

B $x = \frac{2\pi}{3}, \pi$

C $x = \frac{\pi}{6}, \frac{\pi}{2}$

D $x = \pi, \frac{4\pi}{3}$

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12 An expression equivalent to $\frac{1 - \cos^2 x}{\cos^2 x}$ is

- A $\cot^2 x$
- B $\sin^2 x$
- C $\tan^2 x$
- D 1

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13 The graph below shows a sinusoidal function. The amplitude of the function is

- A 2
- B 4
- C 5
- D 10

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14 The graph of $y = \sin(kx)$, where $k > 0$, completes exactly 3 cycles on the interval $0 \le x \le 2\pi$. The period of the function is

- **A** 6π
- **B** 3π
- **C** $\frac{\pi}{3}$
- **D** $\frac{2\pi}{3}$

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15 A sector of a circle with radius 10 cm has a central angle of 1.2 radians. The area of the sector is

- **A** 30 cm^2
- **B** 60 cm^2
- **C** 120 cm^2
- **D** 50 cm^2

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16 If $\csc\theta = -\frac{5}{3}$ and θ is in Quadrant IV, then the exact value of $\cos\theta$ is

- **A** $\frac{4}{5}$
- **B** $-\frac{4}{5}$
- **C** $\frac{3}{5}$
- **D** $-\frac{3}{5}$

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17 The sum of all solutions to the equation $\tan^2 x = 3$ on the interval $0 \leq x < 2\pi$ is

- **A** 3π
- **B** 4π
- **C** 2π
- **D** 5π

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18 **The graph below shows a function of the form y = asin(bx) + d, with a > 0. The value of a + d is**

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19 **An angle with a measure of -470° is coterminal with an angle with a measure of**

A 110°

B -100°

C 290°

D 250°

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20 **The graph below shows a sine function on the interval $0 \leq x \leq 2\pi$ Its equation is**

A $y = -2\sin(2x) - 1$

B $y = 2\sin(2x) - 1$

C $y = -2\sin(\frac{x}{2}) - 1$

D $y = -2\sin(2x) + 1$

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21 **The exact value of $\sin(\frac{11\pi}{6})\cos(\frac{11\pi}{6})$ is**

A $\frac{\sqrt{3}}{4}$

B $-\frac{\sqrt{3}}{2}$

C $-\frac{\sqrt{3}}{4}$

D $\frac{1}{4}$

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22 **Each of the following angles is a solution to the equation $2\cos^2 x - \cos x = 0$ on the interval $0 \leq x < 2\pi$, except**

A $\frac{\pi}{2}$

B $\frac{\pi}{3}$

C $\frac{5\pi}{6}$

D $\frac{3\pi}{2}$

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23 **A bicycle wheel with a radius of 0.40 m rotates through an angle of 15 radians. The distance, in metres, that the bicycle travels is**

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24 **The diagram below shows a sinusoidal function on the interval $0 \leq x \leq 2\pi$ Its equation is**

- **A** $y = 2\cos x + 3$
- **B** $y = -2\cos x + 3$
- **C** $y = 2\cos(2x) + 3$
- **D** $y = 2\sin x + 3$

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25 **A Ferris wheel with a diameter of 26 m has its lowest point 2 m above the ground. A rider boards at the lowest point, and the wheel completes one revolution in 4 minutes. The height of the rider, h(t), after t minutes is modelled by**

- **A** $h(t) = -13\cos(\frac{\pi}{2}t) + 15$
- **B** $h(t) = 13\cos(\frac{\pi}{2}t) + 15$
- **C** $h(t) = -13\cos(2\pi t) + 15$
- **D** $h(t) = -13\sin(\frac{\pi}{2}t) + 15$

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ANSWER KEY

1.	A	**10.**	31	**19.**	D
2.	B	**11.**	B	**20.**	A
3.	C	**12.**	C	**21.**	C
4.	B	**13.**	C	**22.**	C
5.	C	**14.**	D	**23.**	6
6.	D	**15.**	B	**24.**	A
7.	A	**16.**	A	**25.**	A
8.	B	**17.**	B		
9.	D	**18.**	9		

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