

## Trig equations practice (M3 7.5)

Solve each equation for  $0 \leq \theta < 2\pi$ .

1)  $1 = \cos \theta$

2)  $\frac{\sqrt{3}}{2} = \sin \theta$

3)  $6\cos \theta = -3$

4)  $-5 + \cos \theta = -4$

5)  $\cos\left(\theta + \frac{4\pi}{3}\right) = -\frac{1}{2}$

6)  $\cos\left(\theta + \frac{\pi}{3}\right) = \frac{1}{2}$

7)  $2 = 2\sin\left(\theta + \frac{\pi}{6}\right)$

8)  $-2\sqrt{3} = -4\cos 2\theta$

9)  $\frac{2}{3} \cdot \cos \frac{\theta}{4} = -\frac{\sqrt{3}}{3}$

10)  $8\sin \frac{\theta}{3} = 4\sqrt{3}$

11)  $1 = 1 + \sin\left(-2\theta + \frac{2\pi}{3}\right)$

12)  $-8\sin\left(-2\theta + \frac{\pi}{3}\right) = -4$

13)  $-6\sin\left(2\theta + \frac{7\pi}{6}\right) = 3\sqrt{2}$

14)  $2 = 2 + \sin\left(\frac{\theta}{3} + \frac{2\pi}{3}\right)$

**Find all solutions to each equation in radians.**

15)  $2 + \cos(3\theta + \pi) = \frac{3}{2}$

16)  $\frac{\sqrt{3}}{3} = \frac{2}{3} \cdot \sin\left(-2\theta + \frac{\pi}{6}\right)$

17)  $\frac{8 - \sqrt{3}}{2} = 4 + \cos\left(4\theta + \frac{\pi}{3}\right)$

18)  $0 = -\frac{1}{5} \cdot \cos\left(\frac{\theta}{4} + \frac{2\pi}{3}\right)$

19)  $3\sqrt{3} = 3\tan\left(-\theta + \frac{\pi}{3}\right)$

20)  $-\sqrt{3} = -3\tan\left(-\theta + \frac{5\pi}{6}\right)$

21)  $4\sin\left(-2\theta + \frac{2\pi}{3}\right) = -2\sqrt{3}$

22)  $3 + \cos\left(4\theta + \frac{5\pi}{6}\right) = 2$

## Answers to Trig equations practice (M3 7.5)

- |  |  |  |            |
|--|--|--|------------|
| 1) $\{0\}$   | 2) $\left\{\frac{\pi}{3}, \frac{2\pi}{3}\right\}$  | 3) $\left\{\frac{2\pi}{3}, \frac{4\pi}{3}\right\}$                                       | 4) $\{0\}$ |
| 5) $\left\{0, \frac{4\pi}{3}\right\}$  | 6) $\left\{0, \frac{4\pi}{3}\right\}$  | 7) $\left\{\frac{\pi}{3}\right\}$  |            |
| 8) $\left\{\frac{\pi}{12}, \frac{11\pi}{12}, \frac{13\pi}{12}, \frac{23\pi}{12}\right\}$ | 9) No solution.  | 10) $\{\pi\}$  |            |
| 11) $\left\{\frac{\pi}{3}, \frac{5\pi}{6}, \frac{4\pi}{3}, \frac{11\pi}{6}\right\}$      | 12) $\left\{\frac{\pi}{12}, \frac{3\pi}{4}, \frac{13\pi}{12}, \frac{7\pi}{4}\right\}$    | 13) $\left\{\frac{\pi}{24}, \frac{7\pi}{24}, \frac{25\pi}{24}, \frac{31\pi}{24}\right\}$ |            |
| 14) $\{\pi\}$  | 15) $\left\{-\frac{\pi}{9} + \frac{2\pi n}{3}, \frac{\pi}{9} + \frac{2\pi n}{3}\right\}$ | 16) $\left\{-\frac{\pi}{12} - \pi n, -\frac{\pi}{4} - \pi n\right\}$                     |            |
| 17) $\left\{\frac{\pi}{8} + \frac{\pi n}{2}, \frac{5\pi}{24} + \frac{\pi n}{2}\right\}$  | 18) $\left\{-\frac{2\pi}{3} + 4\pi n\right\}$  | 19) $\{-\pi n\}$   |            |
| 20) $\left\{\frac{2\pi}{3} - \pi n\right\}$  | 21) $\left\{-\frac{\pi}{2} - \pi n, -\frac{\pi}{3} - \pi n\right\}$                      | 22) $\left\{\frac{\pi}{24} + \frac{\pi n}{2}\right\}$                                    |            |