Solving Basic Trig Equations + More Evaluating HW

Evaluate

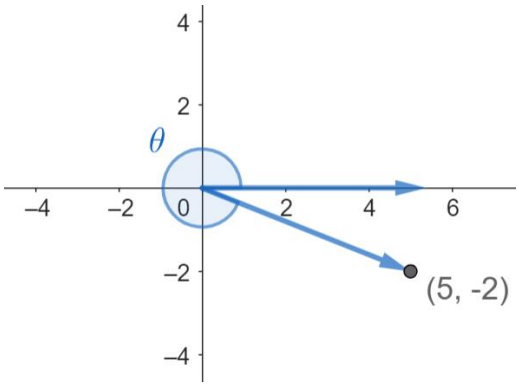
1. $\sin\left(\frac{13\pi}{3}\right)$
2. $\cos\left(-\frac{5\pi}{6}\right)$
3. $\tan\left(\frac{2\pi}{3}\right)$
4. $\sec\left(\frac{3\pi}{2}\right)$
5. $\csc\left(-\frac{7\pi}{3}\right)$
6. $\cot\left(\frac{5\pi}{6}\right)$
7. $\tan\left(-\frac{3\pi}{4}\right)$
8. $\csc\left(-\frac{5\pi}{2}\right)$
9. $\cos\left(\frac{21\pi}{4}\right)$

10. The figure shows an angle of measure θ radians in standard position. The terminal ray of θ passes through the point $(5, -2)$.

    Find $\sin\theta$

    Find $\sec\theta$

    Find $\cot\theta$



11. Given $\sin\theta = -\frac{4}{5}$ and $\cos\theta = \frac{3}{5}$ find...
    a. $\sin(-\theta)$
    b. $\cos(-\theta)$
    c. $\sin(\theta + 2\pi)$
    d. $\sec(\theta)$

Given $\tan\left(\frac{\pi}{12}\right) = 2 - \sqrt{3}$ and $\tan\left(\frac{5\pi}{12}\right) = 2 + \sqrt{3}$, find...

12. $\tan\left(\frac{17\pi}{12}\right)$
13. $\tan\left(-\frac{11\pi}{12}\right)$
14. $\tan\left(\frac{23\pi}{12}\right)$

Find all solutions in the interval $0 \leq \theta < 2\pi$

15. $\sec\theta = \frac{-2\sqrt{3}}{3}$

16. $\csc\theta = \sqrt{2}$

17. $\cot\theta + 1 = 0$

18. $\sqrt{3}\csc\theta - 2 = 0$

19. $\sqrt{2}\sin\theta + 1 = 0$

20. $1 - \tan\theta = \tan\theta + 1$

21. $(\cos\theta)^3 - \cos\theta = 0$ (hint: you know how to solve $x^3 - x = 0$, right?)

22. $(\cos\theta)^2 = \cos\theta$ (hint: you know how to solve $x^2 = x$, right?)

Solving Basic Trig Equations + More Evaluating HW Answers

1. $\frac{\sqrt{3}}{2}$
2. $-\frac{\sqrt{3}}{2}$
3. $-\sqrt{3}$
4. Undefined
5. $-\frac{2\sqrt{3}}{3}$
6. $-\sqrt{3}$
7. 1
8. -1
9. $-\frac{\sqrt{2}}{2}$
10. $\sin\theta = -\frac{2}{\sqrt{29}} = -\frac{2\sqrt{29}}{29}$
    $\sec\theta = \frac{\sqrt{29}}{5}$
    $\cot\theta = -\frac{5}{2}$
11. $\sin(-\theta) = \frac{4}{5}$
    $\cos(-\theta) = \frac{3}{5}$
    $\sin(\theta + 2\pi) = -\frac{4}{5}$
    $\sec(\theta) = \frac{5}{3}$
12. $\tan\left(\frac{17\pi}{12}\right) = \tan\left(\frac{5\pi}{12}\right) = 2 + \sqrt{3}$
13. $\tan\left(-\frac{11\pi}{12}\right) = \tan\left(\frac{\pi}{12}\right) = 2 - \sqrt{3}$
14. $\tan\left(\frac{23\pi}{12}\right) = -\tan\left(\frac{\pi}{12}\right) = -(2 - \sqrt{3}) = -2 + \sqrt{3}$
15. We're looking for a second quadrant or third quadrant angle with reference angle $\frac{\pi}{6}$
    $\theta = \frac{5\pi}{6}$ or $\theta = \frac{7\pi}{6}$
16. We're looking for a first quadrant or second quadrant angle with reference angle $\frac{\pi}{4}$
    $\theta = \frac{\pi}{4}$ or $\theta = \frac{3\pi}{4}$
17. $\cot\theta = -1$
    We're looking for a second quadrant or fourth quadrant angle with reference angle $\frac{\pi}{4}$
    $\theta = \frac{3\pi}{4}$ or $\theta = \frac{7\pi}{4}$
18. $\csc\theta = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$
    We're looking for a first or second quadrant angle with reference angle $\frac{\pi}{3}$
    $\theta = \frac{\pi}{3}$ or $\theta = \frac{2\pi}{3}$
19. $\sin\theta = -\frac{1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$
    We're looking for a third or fourth quadrant angle with reference angle $\frac{\pi}{4}$
    $\theta = \frac{5\pi}{4}$ or $\theta = \frac{7\pi}{4}$
20. $\tan\theta = 0$
    This is going to be a quadrantal angle. Particularly, the angles for which the terminal ray has a slope of zero.
    $\theta = 0$ or $\theta = \pi$
21. $(\cos\theta - 1)(\cos\theta + 1)(\cos\theta) = 0$
    $\cos\theta = 1$ or $\cos\theta = -1$ or $\cos\theta = 0$
    $\theta = 0$ or $\theta = \pi$ or $\theta = \frac{\pi}{2}$ or $\theta = \frac{3\pi}{2}$
22. $(\cos\theta)^2 - \cos\theta = 0$
    $(\cos\theta)(\cos\theta - 1) = 0$
    $\cos\theta = 0$ or $\cos\theta = 1$
    $\theta = \frac{\pi}{2}$ or $\theta = \frac{3\pi}{2}$ or $\theta = 0$