Classroom Voting Questions: Precalculus

The Sum, Difference, Double, and Half Angle Formulas

1. $\sin(90°) = \sin(30°) + \sin(60°)$

   (a) True, and I am very confident.
   (b) True, but I am not very confident.
   (c) False, but I am not very confident.
   (d) False, and I am very confident.

2. $\cos(30°) = \cos(90°) - \cos(60°)$

   (a) True, and I am very confident.
   (b) True, but I am not very confident.
   (c) False, but I am not very confident.
   (d) False, and I am very confident.

3. $\tan(120°) = \tan(90°) + \tan(30°)$

   (a) True, and I am very confident.
   (b) True, but I am not very confident.
   (c) False, but I am not very confident.
   (d) False, and I am very confident.

4. Use the fact that $60° + 45° = 105°$ to calculate $\cos 105°$.

   (a) $\dfrac{\sqrt{2} - \sqrt{6}}{4}$
   (b) $\dfrac{\sqrt{6} - \sqrt{2}}{4}$
   (c) $\dfrac{\sqrt{6} + \sqrt{2}}{4}$
   (d) $-\dfrac{1}{2}$

5. Use the sum and difference formulas to calculate $\cos(57°)\cos(22°) - \sin(57°)\sin(22°)$.

   (a) $\cos(35°)$
   (b) $\sin(35°)$
   (c) $\cos(79°)$
   (d) $\sin(79°)$

6. Use the sum and difference formulas to calculate $\sin(44°)\cos(19°) - \cos(44°)\sin(19°)$.

   (a) $\cos(63°)$
   (b) $\sin(63°)$
   (c) $\cos(25°)$
   (d) $\sin(25°)$

7. Suppose $\cos\alpha = \dfrac{3}{5}$ and $\sin\beta = \dfrac{5}{13}$, where α is in quadrant I and β is in quadrant II. Find $\sin(\alpha + \beta)$.

   (a) $-\dfrac{33}{65}$
   (b) $-\dfrac{56}{65}$
   (c) $-\dfrac{58}{65}$
   (d) Not enough information is given.

8. Find a simpler form for $\cos\left(\theta - \dfrac{3\pi}{2}\right)$.

   (a) $\sin\theta$
   (b) $-\sin\theta$
   (c) $\cos\theta$
   (d) $-\cos\theta$

9. Use the sum and difference formulas to calculate $\dfrac{\tan\left(\frac{\pi}{3}\right) - \tan\left(\frac{\pi}{4}\right)}{1 + \tan\left(\frac{\pi}{3}\right)\tan\left(\frac{\pi}{4}\right)}$.

   (a) $\tan\left(\dfrac{\pi}{12}\right)$

(b) $\tan\left(\frac{7\pi}{12}\right)$

(c) $\tan\left(\frac{\pi}{7}\right)$

(d) $\tan(\pi)$

10. $\sin(90°) = 2\sin(45°)$

(a) True, and I am very confident.

(b) True, but I am not very confident.

(c) False, but I am not very confident.

(d) False, and I am very confident.

11. $\cos(120°) = 2\cos(60°)$

(a) True, and I am very confident.

(b) True, but I am not very confident.

(c) False, but I am not very confident.

(d) False, and I am very confident.

12. $\tan(60°) = 2\tan(30°)$

(a) True, and I am very confident.

(b) True, but I am not very confident.

(c) False, but I am not very confident.

(d) False, and I am very confident.

13. Using the double angle formulas, $2\sin(12°)\cos(12°) =$

(a) $\sin(6°)$

(b) $\sin(24°)$

(c) $\cos(6°)$

(d) $\cos(24°)$

14. $\cos 2\theta =$

(a) $2\cos\theta$

(b) $2\sin\theta\cos\theta$

(c) $\cos^2\theta + \sin^2\theta$

(d) $2\cos^2\theta - 1$

15. Using the double angle formulas, $1 - 2\sin^2(40°) =$

(a) $\sin(80°)$

(b) $\sin(20°)$

(c) $\cos(80°)$

(d) $\cos(20°)$

16. $\sin(30°) = \frac{1}{2}\sin(60°)$

(a) True, and I am very confident.

(b) True, but I am not very confident.

(c) False, but I am not very confident.

(d) False, and I am very confident.

17. $\cos(45°) = \frac{1}{2}\cos(90°)$

(a) True, and I am very confident.

(b) True, but I am not very confident.

(c) False, but I am not very confident.

(d) False, and I am very confident.

18. $\tan(90°) = \frac{1}{2}\tan(180°)$

(a) True, and I am very confident.

(b) True, but I am not very confident.

(c) False, but I am not very confident.

(d) False, and I am very confident.

19. Use the half angle formulas to calculate $\sin\left(\frac{\pi}{8}\right)$.

(a) $\sqrt{\dfrac{1-\cos\left(\frac{\pi}{8}\right)}{2}}$

(b) $\sqrt{\dfrac{1+\cos\left(\frac{\pi}{8}\right)}{2}}$

(c) $\sqrt{\dfrac{1-\cos\left(\frac{\pi}{4}\right)}{2}}$

(d) $\sqrt{\dfrac{1-\cos\left(\frac{\pi}{16}\right)}{2}}$

20. Use a half-angle formula to calculate $\cos\left(\dfrac{5\pi}{8}\right)$.

(a) $\sqrt{\dfrac{1+\cos\dfrac{5\pi}{16}}{2}}$

(b) $-\sqrt{\dfrac{1+\cos\dfrac{5\pi}{16}}{2}}$

(c) $\sqrt{\dfrac{1+\cos\dfrac{5\pi}{4}}{2}}$

(d) $-\sqrt{\dfrac{1+\cos\dfrac{5\pi}{4}}{2}}$