Name _____ Date _____

In Exercises 1–6, find the exact value of the expression.

1. $\tan 105°$

2. $\tan(-75°)$

3. $\sin \dfrac{\pi}{12}$

4. $\sin 255°$

5. $\cos(-165°)$

6. $\cos \dfrac{7\pi}{12}$

In Exercises 7–12, evaluate the expression given that $\sin a = \dfrac{3}{5}$ **with** $0 < a < \dfrac{\pi}{2}$
and $\cos b = -\dfrac{5}{13}$ **with** $\pi < b < \dfrac{3\pi}{2}$.

7. $\sin(a + b)$

8. $\sin(a - b)$

9. $\cos(a - b)$

10. $\cos(a + b)$

11. $\tan(a + b)$

12. $\tan(a - b)$

In Exercises 13–15, simplify the expression.

13. $\sin\left(x + \dfrac{\pi}{2}\right)$

14. $\tan(x - \pi)$

15. $\cos(x + \pi)$

16. Describe and correct the error in simplifying the expression.

$$
\begin{aligned}
\times \; \cos\left(x + \frac{3\pi}{2}\right) &= \cos x \cos \frac{3\pi}{2} + \sin x \sin \frac{3\pi}{2} \\
&= (0)\cos x + (-1)\sin x \\
&= -\sin x
\end{aligned}
$$

In Exercises 17–20, solve the equation for $0 \le x < 2\pi$.

17. $\cos\left(x - \dfrac{\pi}{2}\right) = 0$

18. $\tan(x + \pi) = 1$

19. $\cos\left(x + \dfrac{\pi}{4}\right) + \cos\left(x - \dfrac{\pi}{4}\right) = 1$

20. $\sin\left(x + \dfrac{\pi}{6}\right) - \sin\left(x - \dfrac{\pi}{6}\right) = 0$

21. Verify that the tangent function has a period of π by deriving the identity $\tan(x - \pi) = \tan x$ using the difference formula for tangent.