Label the following clearly on each graph (where applicable):

- **Amplitude**
- **Period**
- **Phase shift**
- **Vertical shift**
- **Any reflection**

Part A: Vertical Shifts and Reflections

Sketch the graph of each function.

1. $y = \sin x + 1$
2. $y = 1 - \sin x$
3. $y = \cos x - 1$
4. $y = 1 - \cos x$
5. $y = -\sin x$
6. $y = -\cos x$
7. $y = -\tan x$
8. $y = 1 + \cos x$
9. $y = 2 - \sin x$
10. $y = -3 \sin x$

Part B: Phase Shifts (Horizontal Translations)

Sketch the graph of each function.

11. $y = \sin (x + 30°)$
12. $y = \cos (x - 30°)$
13. $y = \tan (x + \pi/4)$
14. $y = \sin (x - \pi/2)$ (Hint: think about cosine relationship)

Part C: Amplitude Changes (and Reflections)

Sketch the graph of each function.

15. $y = 2 \sin x$

16. $y = \sin 2x$

17. $y = 2 \cos x$

18. $y = \cos 0.5x$

19. $y = -2 \sin x$

Part D: Period Changes

Sketch the graph of each function.

20. $y = \cos 2x$

21. $y = \sin 2x$

22. $y = \tan 3x$

23. $y = \cos(\frac{1}{2} x)$ (also written as $\cos(0.5x)$ or $\cos(x/2)$)

Part E: Mixed Transformations (Multiple Changes)

Sketch the graph of each function. Identify all transformations clearly.

24. $y = 1 + \cos x$

25. $y = 2 - \sin x$

26. $y = -3 \sin x$

27. $y = \cos 2x$

28. $y = 1 - \sin x$

29. $y = 2 \cos x - 1$

30. $y = -2 \sin(x + \pi/4)$

Bonus Challenge Questions

31. $y = 3 \cos(2x - \pi/2) + 1$

32. $y = -\sin(\frac{1}{2}x) + 2$

33. $y = 4 \tan(x - \pi/3) - 1$