PLEASE, BE NEAT AND SHOW ALL YOUR WORK; CIRCLE YOUR ANSWER.

| PROBLEM NUMBER | POSSIBLE POINTS | POINTS EARNED |
|-------------------|--------------------|------------------|
| 1 | 6 | |
| 2 | 6 | |
| 3 | 6 | |
| 4 | 6 | |
| 5 | 6 | |
| 6 | 6 | |
| 7 | 6 | |
| 8 | 6 | |
| 9 | 6 | |
| 10 | 6 | |
| TOTAL | out of 50 | |

1. (a) Determine if the graph given below is a graph of a one-to-one function f. If so, use the reflection property to sketch the graph of f^{-1} .



(b) Find the inverse of $y = \sqrt{3-x}$.



2. Find an exponential function of the form $f(x) = ba^x$ that has *y*-intercept at 8 and passes through the point P(3, 1).



3. (*a*) Change to exponential form the following expressions:

$$\log_2 32 = 5$$
 $\ln m = 3x + 4$ $\log_6(2x - 1) = 3$

(*a*) Change to logarithmic form the following expressions:

$$4^3 = 64$$
 $3^x = 4 - t$ $3^{-2x} = \frac{P}{F}$



4. Write the following expression as one logarithm:

$$2\log\frac{y^3}{x} - 3\log y + \frac{1}{2}\log(x^4y^2).$$



5. Solve the equation:

$$4^{2x+3} = 5^{x-2}$$



6. Solve the equation:

$$\log(\sqrt{x}) = \sqrt{\log x}.$$



7. Find the exact values of the remaining trigonometric functions for the acute angle θ such that:

$$\cos\theta = \frac{4}{5}.$$



8. Verify the identity

$$\frac{1}{(1+\sin\varphi)(1-\sin\varphi)} = \sec^2\varphi$$

by transforming the left-hand side into the right-hand side.



9. Refer to the graph of $y = \sin x$ to find the exact values of x in the interval $[0, 4\pi]$ that satisfy the equation:

$$\sin x = -\frac{\sqrt{2}}{2}.$$



10. Use reference angles to find the exact values of

$$\tan\left(-\frac{\pi}{3}\right) \qquad \sin(-315^\circ) \qquad \cos\left(\frac{11}{6}\pi\right) \qquad \sec(-210^\circ)$$

