This practice exam is for review purposes only; the actual exam may differ in format and content. Use it as a study aid, and refer to the syllabus for specific details. Solutions with explanations can be found on my YouTube channel. - Robert Pearce

Name:_____

1. For $f(x) = 4x$ and $g(x) = x + 5$, find the following functions:

   (a) $(f \circ g)(x)$

   (b) $(g \circ f)(x)$

   (c) $(f \circ g)(3)$

   (d) $(g \circ f)(3)$

2. For $f(x) = \frac{9}{x+8}$ and $g(x) = \frac{7}{x}$, find:

   (a) $(f \circ g)(x)$

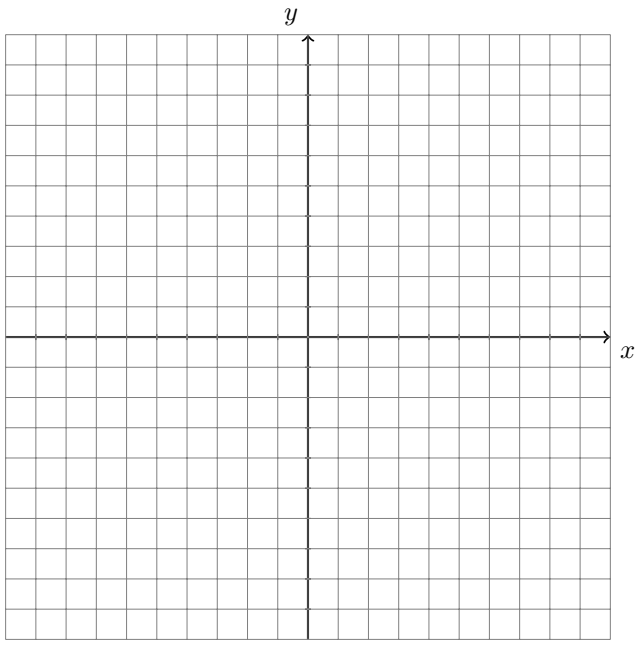
   (b) The domain of $f \circ g$

3. Find the inverse $f^{-1}(x)$ of : $f(x) = 2x - 3$

4. Given the function: $f(x) = (x + 7)^3$

   (a) Find the inverse $f^{-1}(x)$

   (b) Graph $f(x)$ and $f^{-1}(x)$

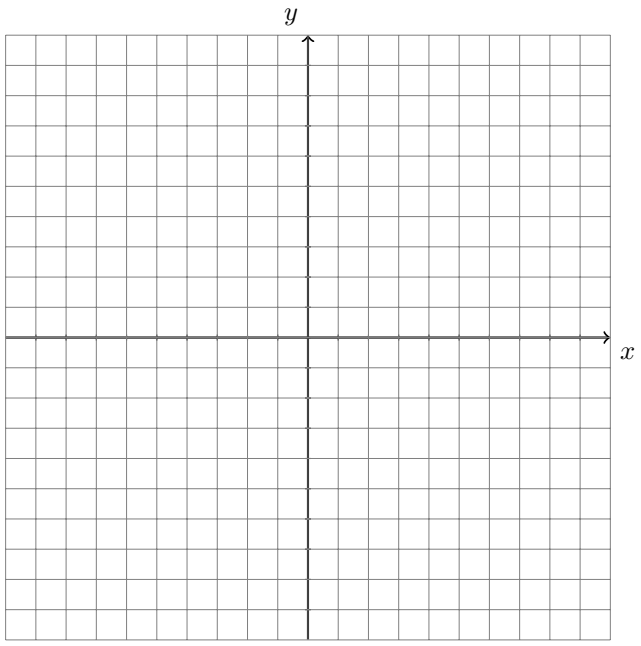


Cont.

5. Given the function: $f(x) = x^3 - 10$

   (a) Find the inverse $f^{-1}(x)$

   (b) Graph $f(x)$ and $f^{-1}(x)$



6. Find the inverse $f^{-1}(x)$ of : $f(x) = (4x - 5)^3$

7. Rewrite exp $\rightarrow$ log: $16 = 4^2$

8. Rewrite log $\rightarrow$ exp: $\log_2(16) = 3$

9. Solve for x: $8^{-x+32} = 32^x$

10. Solve for x: $\log_2(4x + 7) = 4$

11. Evaluate the following without using a calculator: $\log_2(2^{63})$

Cont.

12. Evaluate the following without using a calculator: $3^{\log_3(7)}$

13. Rewrite the expression as one logarithm: $6\log_3(U) + 5\log_3(V)$

14. Solve for x: $\log_2(x) = 3$

15. Solve: $\log(x) + \log(x - 15) = 2$

Cont.

16. You place \$4,000 in a bank account with 2.5% interest rate compounded monthly. How much will you have in the account after 4 years?

17. Kryptonite is a radioactive isotope that decays according to the function $A(t) = A_0 e^{-0.0244t}$, where A_0 is the initial amount present and A is the amount present at time t (in years). Assume we have a 400-gram sample of Kryptonite.

a) What is the decay constant k?

b) How much Kryptonite is left after 40 years?

c) When will only 300-grams of the Kryptonite be left?

d) What is the half-life of the Kryptonite?

Cont.

18. Solve the system by the addition method:

$$\begin{aligned} x + y &= 5 \\ x - y &= 1 \end{aligned}$$

19. Solve the system by the substitution method:

$$\begin{aligned} 7x + 9y &= -11 \\ 2x - y &= 4 \end{aligned}$$

20. Solve the system by the substitution method:

$$\begin{aligned} x - y &= 3 \\ (x-2)^2 + (y+3)^2 &= 4 \end{aligned}$$

The End.