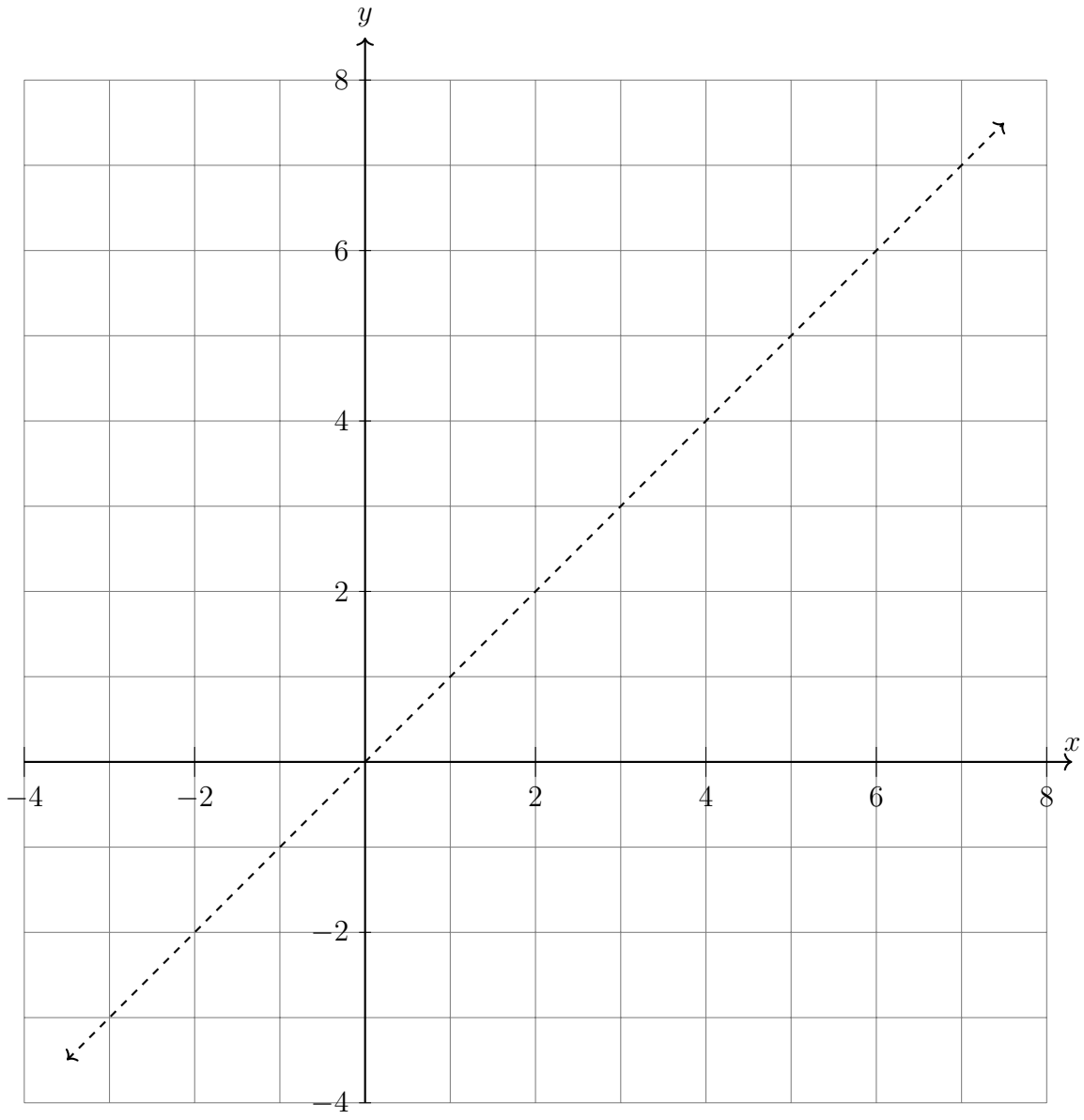
BECA/Huson/Algebra 2: Regents Preparation Name:
11 June 2024

Prep #27 Inverse functions

1. The line $y = x$ is shown on the graph below.
   (a) Graph and label the function $f(x) = 2^x$.
   (b) Graph and label its inverse $f^{-1}(x) = \log_2 x$.
   (c) Mark and label the following points on the appropriate curves:
   $(0, 1)$, $(2, 4)$, $(3, 8)$ and $(1, 0)$, $(4, 2)$, $(8, 3)$

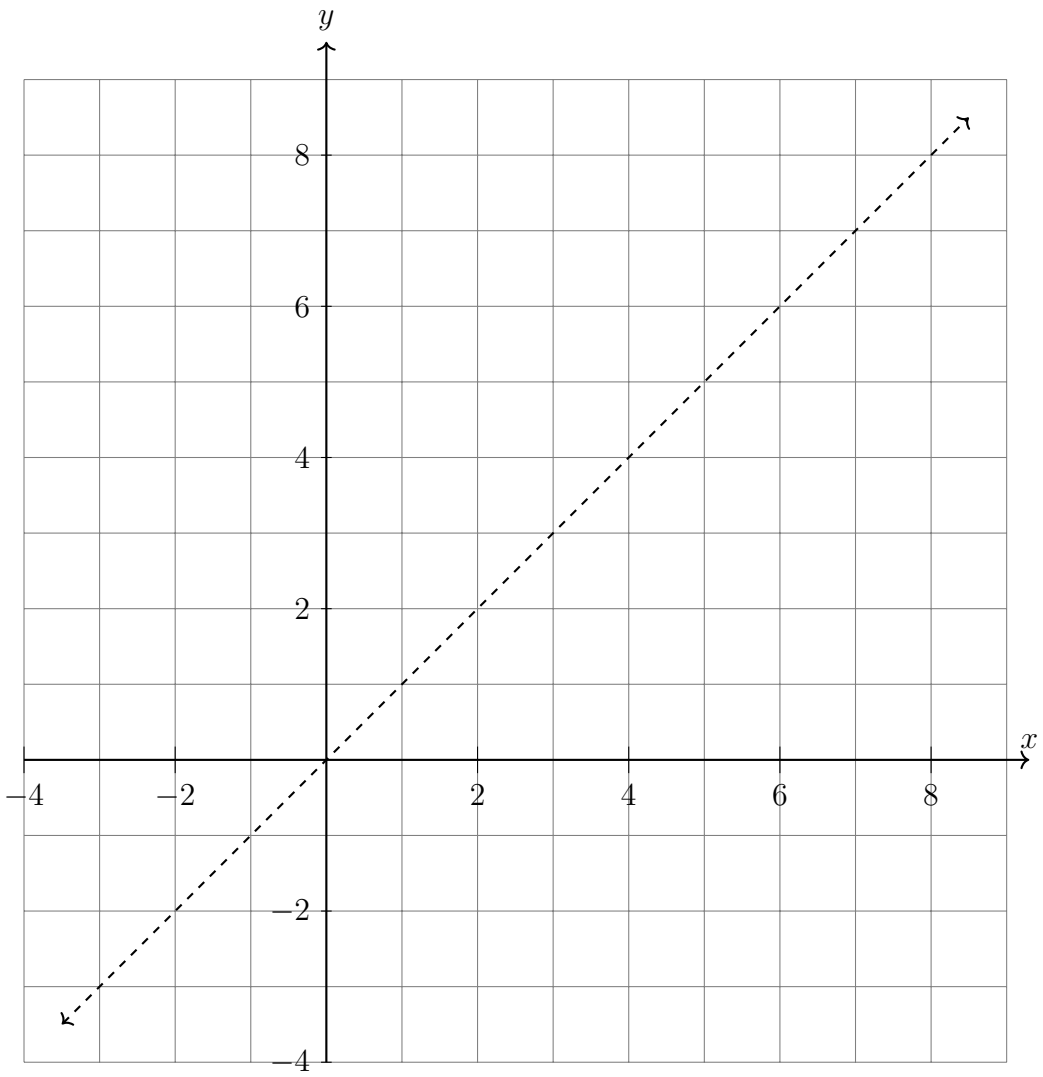


2. The line $y = x$ is shown on the graph below.

   (a) Graph and label the function $f(x) = x^2$.

   (b) Graph and label its inverse $f^{-1}(x) = \sqrt{x}$.

   (c) Mark and label the following points on the appropriate curves:
   $(2, 4)$ and $(4, 2)$, $(3, 9)$ and $(9, 3)$



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3. Biologists create a culture with 2000 microbes initially. The number of microbes will double every 12 hours. Write an equation for the number of microbes, M, after t hours.

4. Larry made a \$5000 investment earning an annual rate of 4.80% compounded monthly.

   (a) Determine the value of the investment after 5 years using the formula

   $$V(t) = 5000 \times (1 + \frac{0.048}{12})^{12t}$$

   .

   (b) Find the time needed for the investment value to reach \$8000, to the *nearest month*.

   (c) Susie made a similar investment of \$5000, earning 5.2% per annum compounded quarterly. Find its value after 5 years, rounded to the *nearest dollar*.

5. Solve the system of equations algebraically.

   (hint: substitute the value of y from the second equation into the first equation)

$$(x-2)^2 + (y-1)^2 = 5$$

$$y = x - 2$$