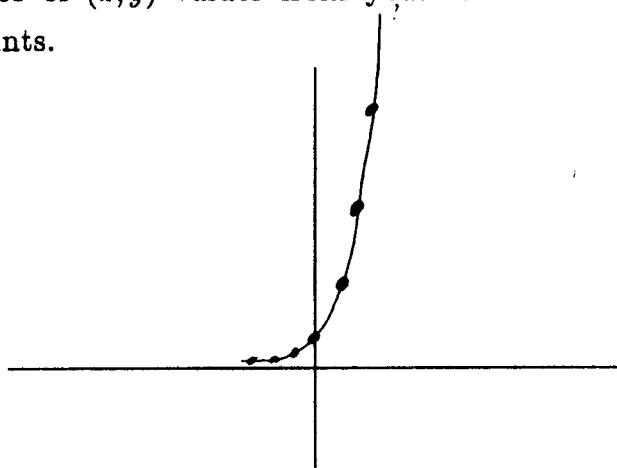


**P-36** We now will study the function of  $x$  given by the equation  $y = 10^x$ .

1. Complete the table below by finding the  $y$ -value for each given  $x$ -value.

$x$	-4	-3	-2	-1	0	1	2	3	4
$y$	$\frac{1}{10000}$	$\frac{1}{1000}$	$\frac{1}{100}$	$\frac{1}{10}$	1	10	100	1000	10000

2. Plot the nine pairs of  $(x, y)$  values from your table in Problem 1. Draw a smooth curve through your points.



3. Does the graph of  $y = 10^x$  ever go below the  $x$ -axis? no Does it ever touch the  $x$ -axis? no

4. What is the  $y$ -intercept of the graph of  $y = 10^x$ ? (0, 1)

5. Does the your sketch rise or fall as  $x$  increases? it rises

6. Suppose you were to sketch  $y = 3^x$ . Would the graph ever go below the  $x$ -axis? no Would it ever touch the  $x$ -axis? no What would be the  $y$ -intercept? (0, 1) Would the curve rise or fall as  $x$  increases? rise

7. The number  $e$  is very important in mathematics. The value of  $e$  is (about) 2.718. Suppose you were to sketch  $y = e^x$ . Would the graph ever go below the  $x$ -axis? no Would it ever touch the  $x$ -axis? no What would be the  $y$ -intercept? (0, 1) Would the curve rise or fall as  $x$  increases? rise

8. Suppose you were to sketch  $y = a^x$  where  $a$  was any (fixed) number greater than one. Would the graph ever go below the  $x$ -axis? no Would it ever touch the  $x$ -axis? no What would be the  $y$ -intercept? (0, 1) Would the curve rise or fall as  $x$  increases? rise