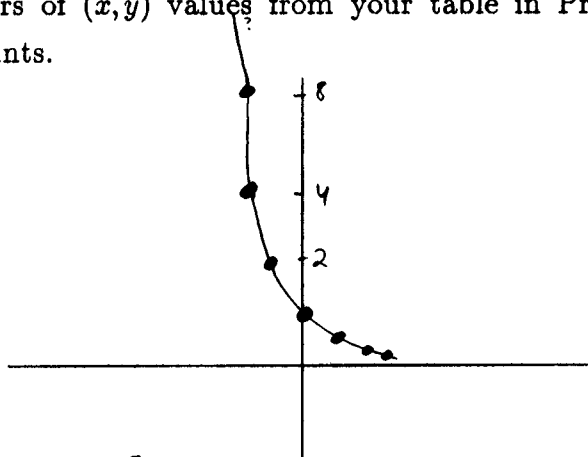


P-37 We now study the function of x given by the equation $y = \left(\frac{1}{2}\right)^x$.

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	16	8	4	2	1	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{16}$

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 $y = \left(\frac{1}{2}\right)^x$ 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 $y = \left(\frac{1}{2}\right)^x$? (0, 1)
5. Does the your sketch rise or fall as x increases? it falls

Anne Hardtszell's brother Jack manages the EasyPay&AlwaysOwe Finance Company which provides funding for the suckers buying used cars from the SureStart Used Cars Lot. One Saturday night a few weeks ago, Anne sold Bob an aging Ford Fairlane for \$1022. Since Bob only had \$22 (see Problem 4 on P-4, and Tim wouldn't share his \$16), he financed the other \$1000 with Jack's help. Jack got Bob a great deal — just 2% per week! The papers Bob signed said something about "compound" interest, but he was sure it was a great deal, just like Jack said.

6. How much does Bob owe after one week? \$1020 After two weeks? \$1040.40
After three weeks? \$1061.21 After four weeks? \$1082.43
7. If you know how much Bob owes this week, how do you find the amount he owes next week?

multiply by 1 + 0.02

8. Find a formula for Bob's debt in terms of the number of weeks he has the money. Can you explain the compound interest formula $P(1+i)^x$?

$\$1000(1.02)^x$
where x is # of weeks

\uparrow P is principal
 i is interest rate (as a decimal)
 x is # of times to compound