$y = 20x$

x	y
0.5	
1	
2	
4	
10	

Power = 1

[x]

Slope = ____

$y = 10x^2$

x	y
1	
2	
4	
6	

Power = 2

[+]

Slope = ____

$y = 10x^3$

x	y
1	
2	
3	

Power = 3

[*]

Slope = ____

$y = 10\sqrt{x}$

x	y
1	
4	
9	

Power = $\frac{1}{2}$

[q]

Slope = ____

$y = 50$

x	y
1	
3	
5	
10	

Power = 0

[o]

Slope = ____

$y = \frac{100}{x}$

x	y
0.5	
1	
2	
5	
10	

Power = -1

[>]

Slope = ____

$y = \frac{1000}{x^2}$

x	y
2	
5	
10	

Power = -2

[<]

Slope = ____

$y = 20 + x^2$

x	y
1	
2	
3	
5	
10	

not a Power Relation

[#]

Is it a straight line?

____
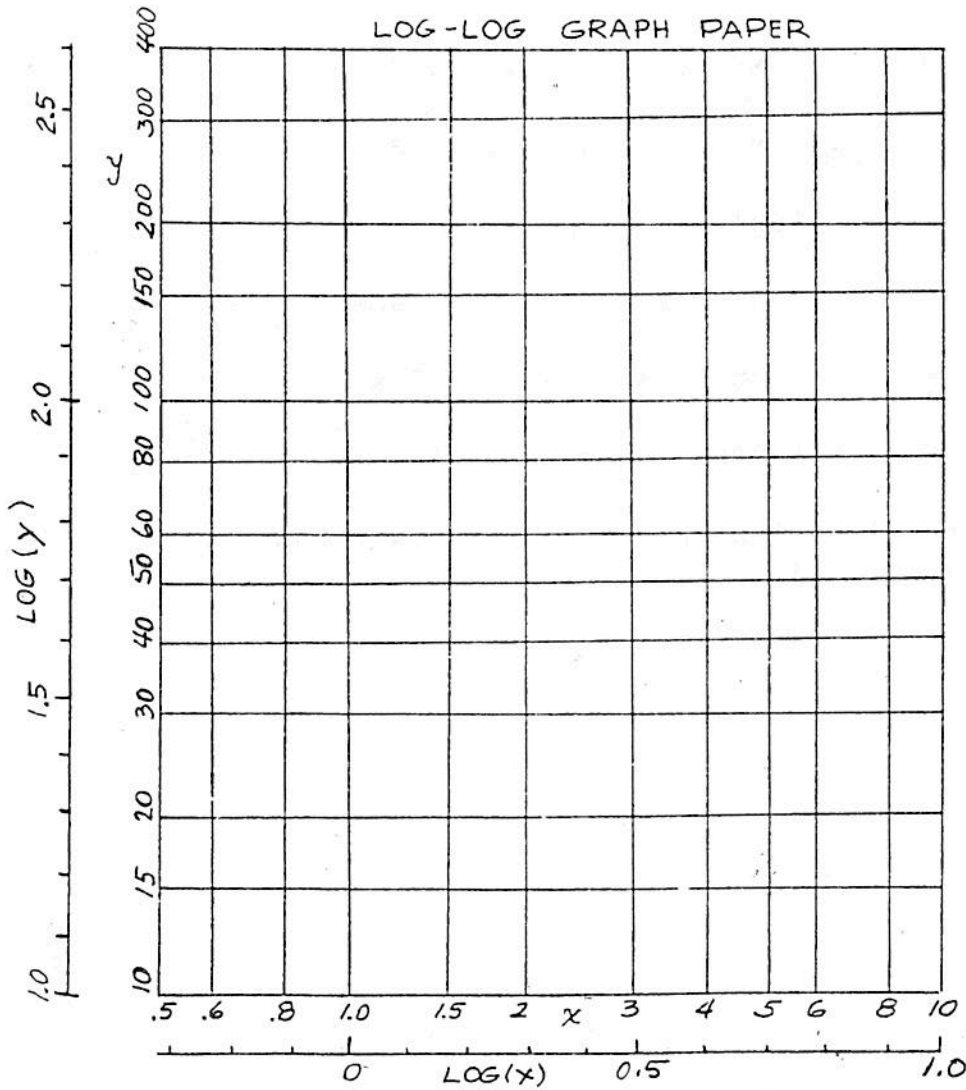
LOG-LOG GRAPH PAPER

Learn: How to use log-log graph paper to graph the <u>logarithms</u> of two
 variables, without having to calculate their logs.
Learn: What a "power function" is   [$y = (constant)(x^n)$]
Learn: that <u>all</u> power functions graph as straight lines when their
 variables are <u>transformed</u> to their logs.
Learn: the relation between the <u>power</u> (n in the equation $y=Ax^n$)
 and the <u>slope</u> of the graph of log(y) vs log(x)
Learn: what a <u>negative power</u> means in a power function, and what
 such a function looks like on the log-log graph.

   On the log-log graph paper you are given for this homework, the range of
   x-values goes from 0.5 to 10, and the range of y-values goes from 10 to
   400. In each of the following problems, calculate 'y' for each of the
   values of 'x' that are given. Then graph log(y) vs log(x), without
   calculating the logarithms. So that you can tell which points go with
   which function, use the symbols [ ] given with each problem. Connect the
   points and measure the slope -- using <u>centimeters</u>, or <u>log values</u>, not the
   numbers whose logs you have graphed.

<u>1.</u>   [×] Power: 1 $y=20x$ (x is the same as x^1) for x = 0.5, 1, 2, 4, 10

<u>2.</u>   [+] Power: 2 $y=10x^2$ for x = 1, 2, 4, 6

<u>3.</u>   [*] Power: 3 $y=10x^3$ for x = 1, 2, 3

<u>4.</u>   [q] Power: 1/2 $y=10x^{(1/2)}$ (same as 10 x square root of x)   for x = 1, 4,

<u>5.</u>   [o] Power: 0 $y=50x^0$ ($x^0=1$, so the same as: y=50) for x = 1, 3, 5, 10

<u>6.</u>   [>] Power: -1 $y=100x^{-1}$ (same as y=100/x)   for x = 0.5, 1, 2, 5, 10

<u>7.</u>   [<] Power: -2 $y=1000x^{-2}$ (same as $y=1000/(x^2)$)   for x = 2, 5, 10

<u>8.</u>   [#] Finally a function that is <u>not</u> a power function: $y = 20 + x^2$
        for x = 1, 2, 3, 5, 10