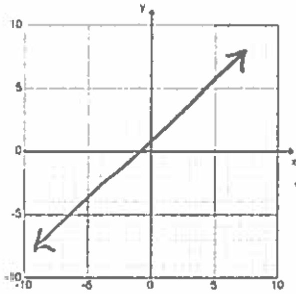
Common Graphs

Sketch each of the common graphs and write the defining characteristic that you see in an equation that helps you identify each type.

Linear $y=mx+b$



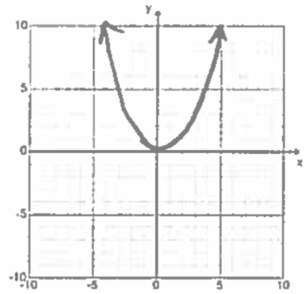
$m>0$

$m<0$

$m=0$

$m=$ und. not a fcn.

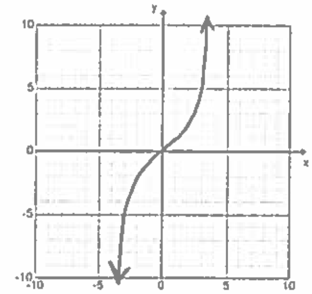
Quadratic $y=ax^2$



$a>0$

$a<0$

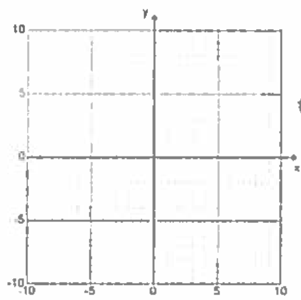
Cubic $y=ax^3$



$a>0$

$a<0$

Polynomial deg of 3 or ↑



deg → LC

even +

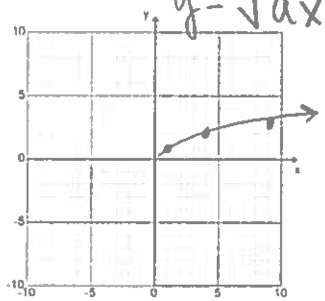
−

odd −

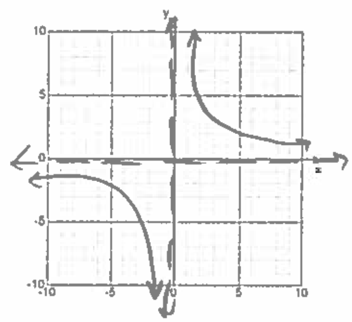
+

Radical $y=a\sqrt{x}$

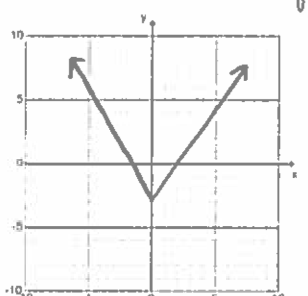
$y=\sqrt{ax}$



Rational $y=\frac{?}{\text{“}x\text{”}}$



Absolute Value $y=a|x|$

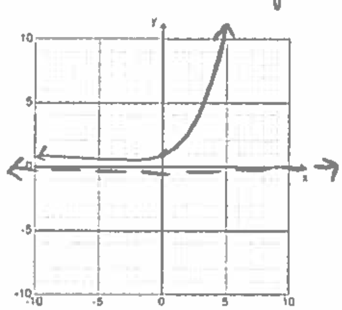


$a>0$

$a<0$

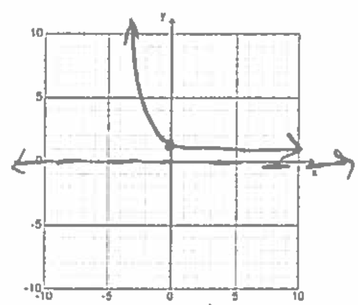
$\pm a=m$ (slope of ea side!)

Exponential $y=ab^x$



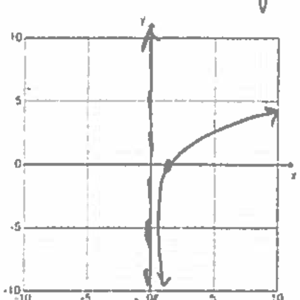
$b>1$

y int: $(0,1)$



$0<b<1$

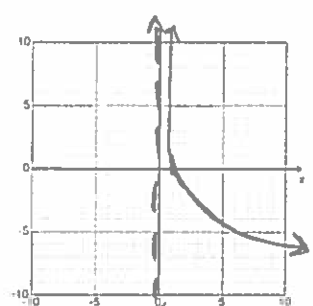
Logarithmic $y=\log_a x$



$a>1$

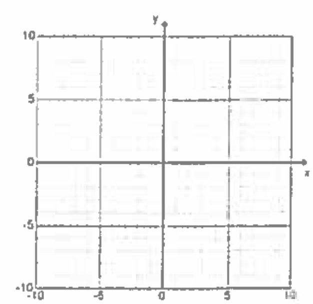
$(\ln x)$

x int: $(1,0)$



$0<a<1$

Logistic



Linear, Quad, Exp., cubic

Example:
A printing company prints advertising flyers and tracks its profits. Write a function that models the given data.

Flyers Printed	Profit ($)
100	10
200	70
300	175
400	312
500	500
600	720

Q: $y = .002x^2 + .007x - 11.2$

↳ Better Fit than Exp.

Example:
The data set shows the population of a small town since 1990. Using 1990 as a reference year, write a function that models the data. (year 0)

	Year	Population
0	1990	400
3	1993	490
7	1997	642
10	2000	787
12	2002	901
15	2005	1104
16	2006	1181

E: $y = 399.99(1.07)^x$

↳ Better fit than Quad.

Example:
This table shows the mass in grams m of the radioactive substance iodine-131 remaining in a container t days after the beginning of an experiment.

Time t (days)	0	1	2	3	4	5	6
Mass m (g)	1000	917.40	841.62	772.10	708.33	649.82	596.14

E: $y = 1000(0.917)^x$

↳ Better fit than Linear

a. Write a function that models the data.

b. Use your model to predict the number of grams of iodine-131 that will be left after 20 days. x $y = 178.31$ g.

c. Use your model to predict when there will be less than 50 grams remaining. y $x = 34.75$

≈ 35 days