IB Math Studies BELL WORK

A bowl of fruit contained 5 oranges and 7 apples a child selected two pieces of fruit to take to school.

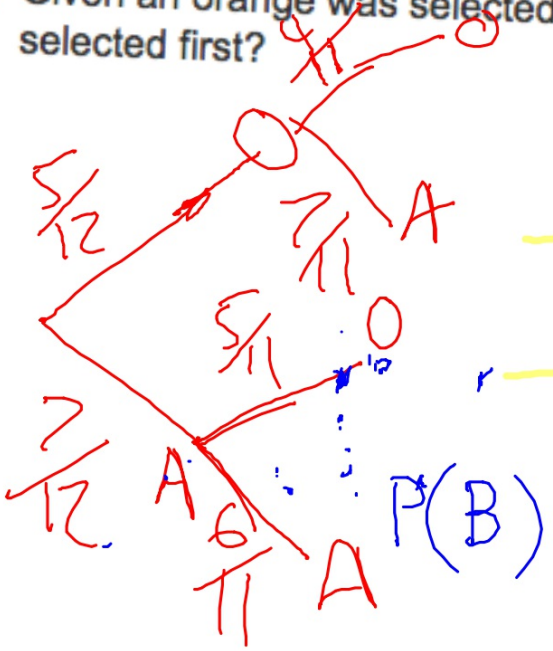
(i) Draw a tree diagram to show the possible choices made

(ii) Calculate the probability of selecting an orange?

(iii) Given an orange was selected, what is the probability that a apple was selected first?

B: An orange was selected

A: apple selected 1st



$\frac{20}{132}$

$\frac{35}{132}$

$\frac{35}{132}$

$\frac{90}{132} = \frac{15}{22}$

$P(A|B) = \frac{P(A \cap B)}{P(B)}$

$P(B)$

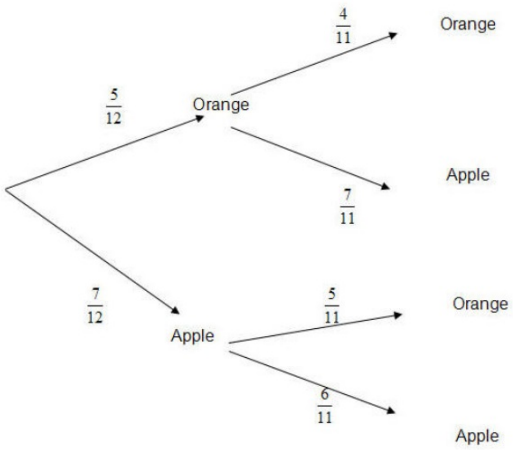
$\frac{\frac{35}{132}}{\frac{90}{132}}$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$P(\text{apple 1st} \mid \text{orange}) = \frac{\frac{35}{132} \times \frac{132}{90}}{\frac{90}{132}}$$

$$\frac{35}{90} = \frac{7}{18}$$

(i)



(ii) There are three ways of getting an orange

$(orange first \cap apple \sec ond)$ or $(apple first \cap orange \sec ond)$ or

$(orange first \cap orange \sec ond) = (\frac{5}{12} \times \frac{7}{11}) + (\frac{7}{12} \times \frac{5}{11}) + (\frac{5}{12} \times \frac{4}{11}) = \frac{15}{22}$

(iii) We now need to use the conditional probability formula

$P(A\backslash B) = \frac{P(A \cap B)}{P(B)}$ where $P(B) = \frac{15}{22}$ and $P(A \cap B) = \frac{7}{12} \times \frac{5}{11} = \frac{35}{132}$

So $P(A\backslash B) = \frac{\frac{35}{132}}{\frac{15}{22}} = \frac{7}{18}$

Chapter 19

Unfamiliar functions

Syllabus reference: 6.5, 6.6, 6.7

Contents:

Important features of graphs:

The main features we are interested in are:

- the axes intercepts where the graph cuts the x and y-axes → calc "zero" value $x=0$
- turning points (local maxima and local minima) calc: max / min
- the domain and range
- values of x where the function does not exist
- the presence of asymptotes, or lines that the graph approaches.

Graphs to Know and Love

Coolmath®.com

Know them and be a happy student...

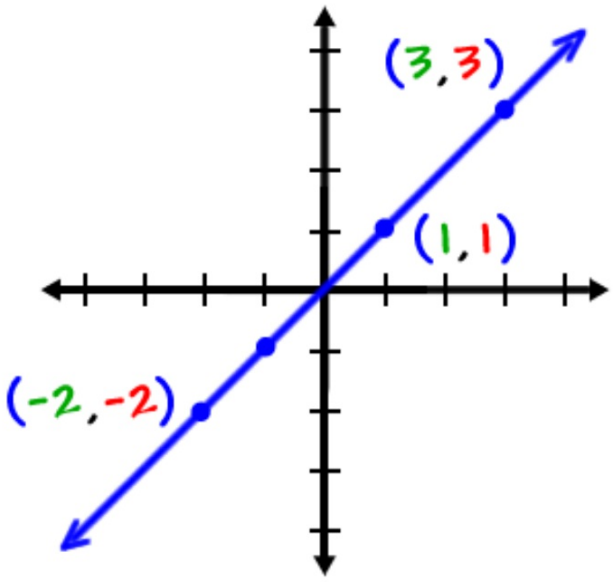
Love them and be a happy geek!

Graphs to Know and Love

First, here's a special line guy that you've probably seen before... I call him

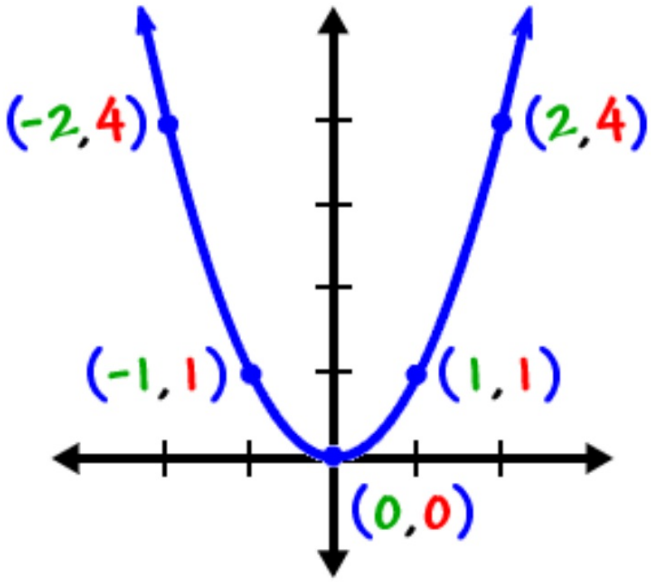
45° Line Guy:

$y = x$



And you probably already love Standard Parabola Guy:

$y = x^2$

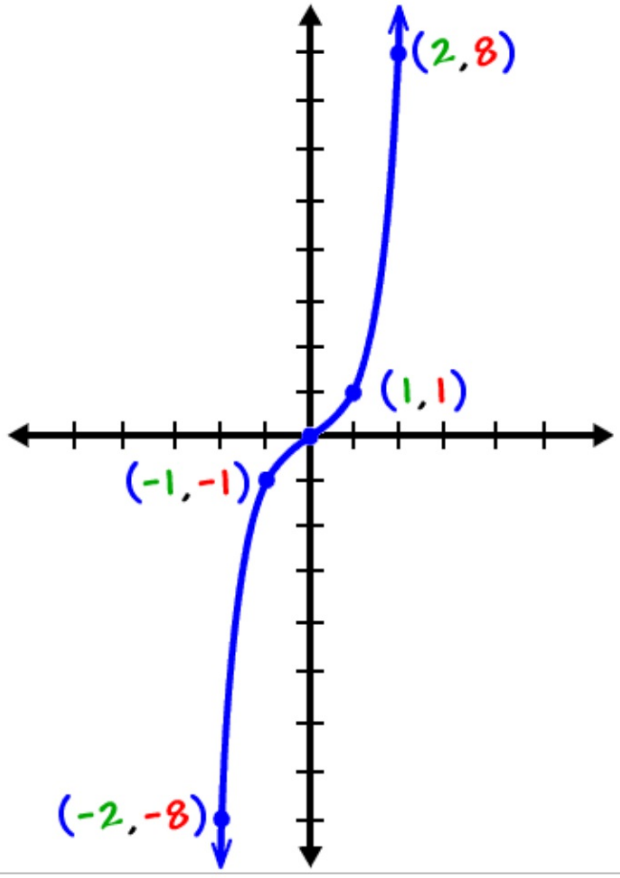


Here are some that may be new to you:

The Disco Graph:

$y = x^3$

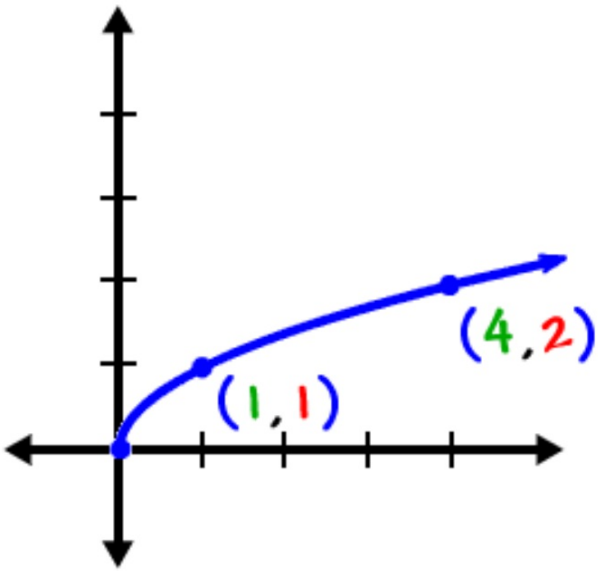
You know...
John Travolta?
That pose?



Square Root Guy:

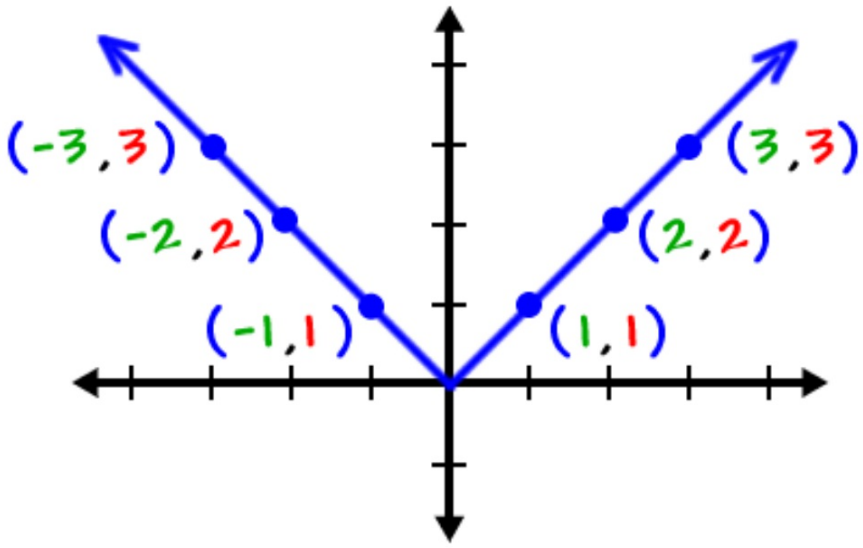
$$y = \sqrt{x}$$

It's just half of
a parabola lying
on its side.



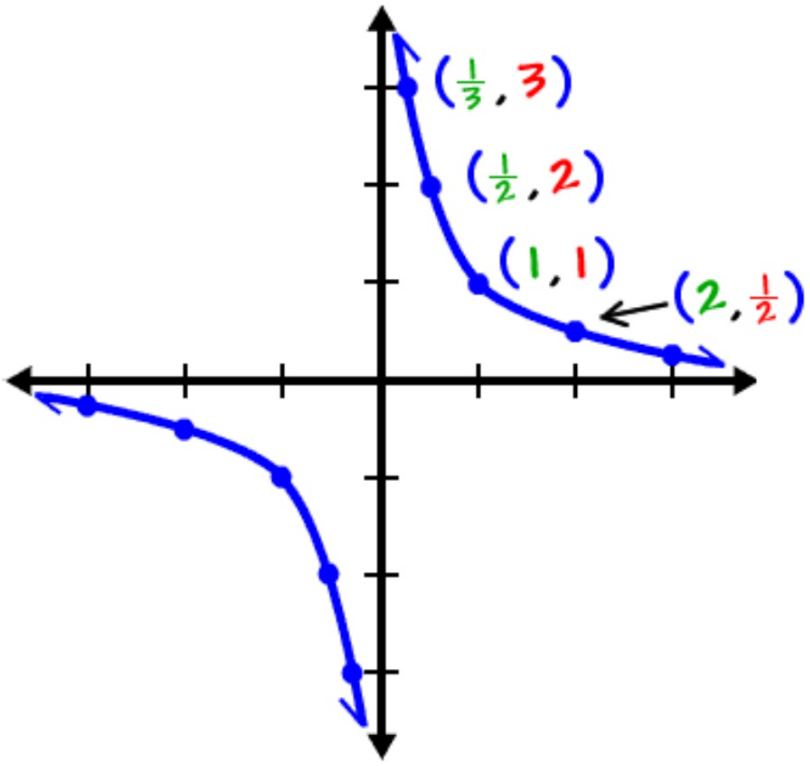
Absolute Value Guy (or V guy):

$y = |x|$



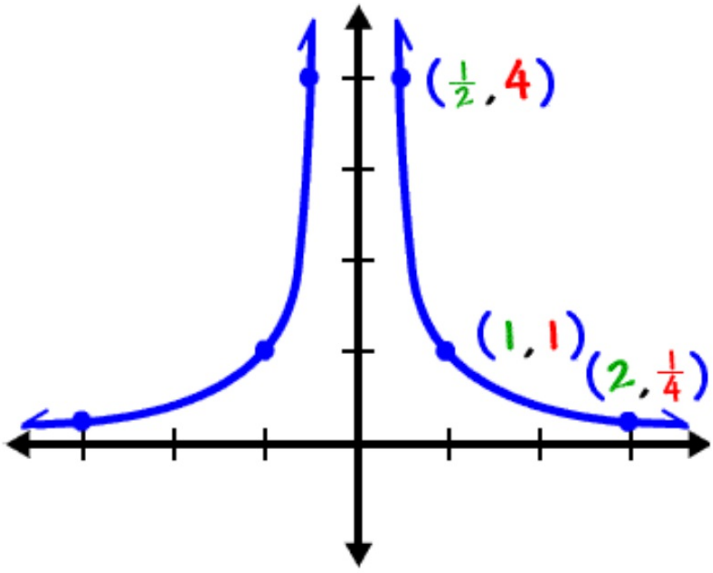
The Flying Butterfly:

$y = \frac{1}{x}$



The Volcano:

$$y = \frac{1}{x^2}$$



http://www.coolmath.com/precalculus-review-calculus-intro/precalculus-algebra/05-graphing-basic-graphs-01

So, there's the list.

Consider the function $y = x^4 - 4x^3 + x^2 + 3x - 5$.

a By first graphing the function on your calculator, sketch the function.

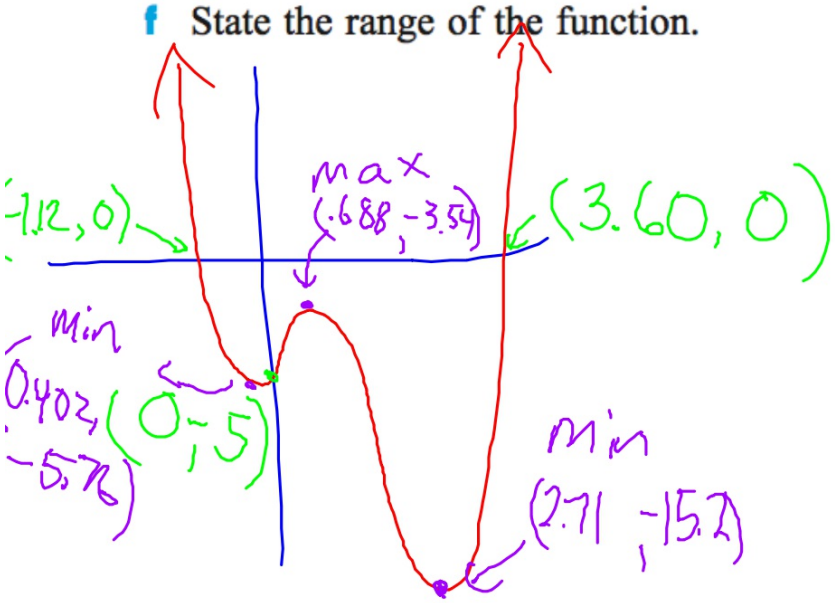
b Find the axes intercepts.

c Find the coordinates and nature of any local maxima or minima.

d Discuss the behaviour of the function as $x \to \infty$ and $x \to -\infty$.

e Add to your graph in **a** the key features found in **b** and **c**.

f State the range of the function.



Range

$\{y \mid y \geq -15.2\}$

Exercise 19 A # 1, 3 a, c, e