How did the
homework
go ????

Parent Functions

Learning Goals
- **draw 6 parent functions**
- **determine the shape of each parent function**
- **observe special features of parent functions**

Family - is a collection of functions that have common characteristics

Parent Function - The simplest, function of a family

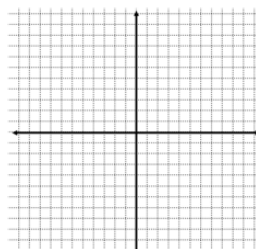We will investigate six parent functions today.

    Linear
    Quadratic
    Square Root
    Reciprocal
    Exponential
    Sinusoidal
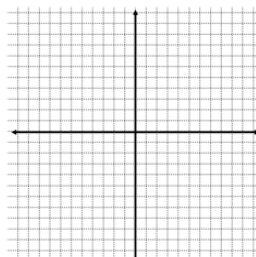
Graph by Hand - No TI-Nspires

1. $f(x) = x$ Name:

x	y

Properties:

2. $f(x) = x^2$ Name;

x	y

Properties:

3. $f(x) = \sqrt{x}$ Name:

x	y

Properties:

4. $f(x) = \dfrac{1}{x}$

x	y

Name:

Properties:

5. $y = 2^x$

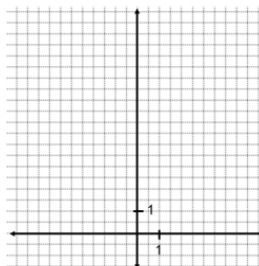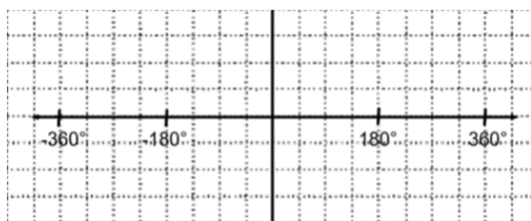| x	y
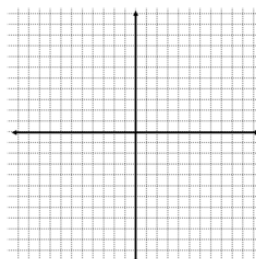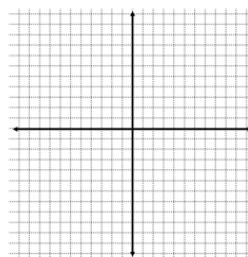
Name:

Properties:

6. $y = \sin x$

- Use TI to graph
- Graph setting – degrees
- Window settings – zoom-trig

Homework

Handout - Mike and Brooke hit a golfball...

MCR3U   *3.1 Properties of Quadratic Functions*

Applications of Quadratic Functions – The Flight of the Golf Ball

Mike Weir hits a golf ball upwards from the top of a cliff.
The height of the ball above the base of the cliff is modelled by $h(t) = -6t^2 + 24t + 72$, where h is height in metres and t is the time in seconds.

a) Draw a **picture** of Mike, the cliff, and the flight of the golf ball.

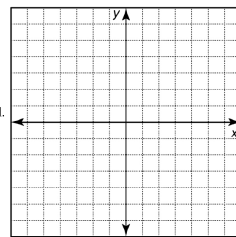As you answer the following questions add the measurements to your picture.

b) How high is the cliff? _____

b) When will the ball hit the ground?

A Drawing of Mike and the Golf Ball

c) When will the ball reach its' maximum height?

d) What is the maximum height of the ball?

A Graph of the Flight of the Golf Ball

e) Graph the function.

f) Determine the Domain that describes the flight of the ball.

g) Determine the Range that describes the flight of the ball.

h) When will the ball reach a height of 42 m?

MCR3U   *3.1 Properties of Quadratic Functions*

Application of Quadratic Functions – The Flight of the Golf Ball – Part Two

Brooke Henderson has a difficult golf shot to make. Her ball is 100 m from the hole. She wants the ball to land 5 m in front of the hole, so it can roll to the hole. A 20 m tree is between her ball and the hole, 60 m from Brooke's ball and 40 m from the hole. With the base of the tree as the origin, write an algebraic expression to model the height of the ball if it just clears the top of the tree.

a) Draw a picture of Brooke and her ball, the tree, and the hole and mark all given measurements.

A Drawing of Brooke and her Golf Ball

b) Sketch a Graph of the Flight (*hint – a parabola is symmetrical*)
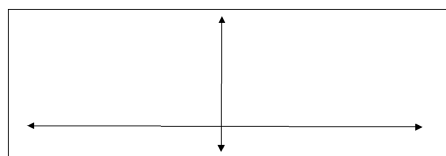
c)   Develop an algebraic model for the flight.

d)   Check your model by graphing on Nspire and identifying the critical points of the flight.

e)   Determine the Domain and Range that describes the flight of the ball.

4