## Unit 7 Lesson 23: Comparing Functions

### 1 Math Talk: Evaluating Functions (Warm up)

#### Student Task Statement

Mentally evaluate each of the functions when $x=3$.

$f\left(x\right)=x^{2}−4x+1$

$g\left(x\right)=6x−2x^{2}$

$h\left(x\right)=\left(x−4\right)\left(x−3\right)$

$j\left(x\right)=2\left(x−1\right)\left(x+2\right)$

### 2 Comparing Functions

#### Images for Launch



#### Student Task Statement

The notation $f\left(2\right)$ means the output of function $f$ when $x$ is 2. For each function, determine whether $f\left(2\right)>f\left(3\right)$, $f\left(2\right)<f\left(3\right)$, or $f\left(2\right)=f\left(3\right)$.

1. $f\left(x\right)=x^{2}+2x+3$
2. $f\left(x\right)=\left(x−2\right)\left(x−3\right)$
3. $f\left(x\right)=-x^{2}+5$
4. 
5. 
6. 
7. 

### 3 Finding the Vertex

#### Student Task Statement

Write each function in vertex form, then find the coordinates of the vertex.

1. $y=x^{2}−4x+7$
2. $y=\left(x−1\right)\left(x+3\right)$
3. $y=\left(x−2\right)\left(x+2\right)$
4. $y=x^{2}−2x+1$
5. $y=-x^{2}−2x−6$
6. $y=2x^{2}−12x+22$
7. 



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