

Part 1: Simplify each of the following

1. $(2y - 1)(3y + 4)$ $6y^2 + 8y - 3y - 4$ $6y^2 + 5y - 4$	2. $2x(4x - 1) - (x - 3)$ $8x^2 - 2x - x + 3$ $8x^2 - 3x + 3$	3. $m(m - 2) + 3m(m - 4)$ $m^2 - 2m + 3m^2 - 12m$ $4m^2 - 14m$
4. $(8h - 1) - (8h + 1)$ $8h - 1 - 8h - 1$ -2	5. $3(d - 2)(3d + 2)$ $(3d - 6)(3d + 2)$ $9d^2 + 6d - 18d - 12$ $9d^2 - 12d - 12$	6. $(7k + 2) - (6k - 2)$ $7k + 2 - 6k + 2$ $k + 4$
7. $(3r - 1)(3r + 1)$ $9r^2 + 3r - 3r - 1$ $9r^2 - 1$	8. $(w - 5)(w + 5)$ $w^2 + 5w - 5w - 25$ $w^2 - 25$	9. $(9t - 11) - (8t - 11)$ $9t - 11 - 8t + 11$ t

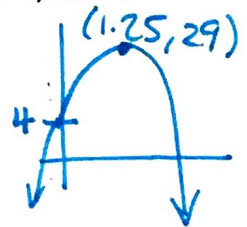
Part 2: Find the following for the provided functions. Round to the nearest hundredth if necessary.

10. $f(x) = -5x^2 - 2x + 8$	11. $f(x) = (x - 1)(3x + 2)$
Vertex: $(-0.2, 8.2)$	Vertex: $(.17, -2.08)$
Minimum or Maximum: <u>Maximum</u>	<u>Minimum</u> or Maximum
Find $f(-2)$: -8	Find $f(5)$: 68
Find x if $f(x) = 5$: $x = -1$ and $x = 5$	Find x if $f(x) = 2$: $x = -1$ and $x = 1.33$

Part 3: Application

12. Jason kicked a football on a projectory path that followed the model $h(t) = -16t^2 + 40t + 4$, where $h(t)$ is the height of the ball in feet off of the ground and t is the time in seconds.

- What is the maximum height of the football? 29 ft
- When does the football reach its maximum height? 1.25 sec.
- From what height did the football start its parabolic path? 4 ft
- What was the height of the football 2.5 seconds after it was kicked? 4 ft
- At what time did the football reach a height of 20 feet on its way down? 2 sec.
- When did the football reach a height of 30 feet? never
- When did the football collide with the ground? ≈ 2.60 sec.



Part 4: Tables. Complete each of the following for the provided tables. For your explanations use phrases such as 1st difference, 2nd difference, common difference, common ratio, etc. THEN WRITE THE RECURSIVE AND EXPLICIT EQUATION FOR EACH OF THE PATTERNS.

x	y
-3	-19
-2	-17
-1	-15
0	-13
1	-11
2	-9

+2
+2
+2
+2
+2
+2

x	y
-2	12
-1	3
0	0
1	3
2	12
3	27

-9
+6
-3
+6
+3
+6
+9
+6
+15
+6

x	y
0	0
1	5
2	40
3	135
4	320
5	625

+5
+30
+35
+60
+95
+90
+185
+120
+305

NOT Quadratic, Linear, or Exponential

Pattern Type: Linear

Pattern Type: Quadratic

Pattern Type: _____

Why? 1st difference is constant

Why? 1st difference linear + 2nd difference constant

Why? N/A

Explicit: $y = 2x - 13$

Explicit: $y = 3x^2$

Explicit: N/A

Recursive: $f(1) = -11$
 $f(n) = f(n-1) + 2$

Recursive: $f(1) = 3$
 $f(n) = f(n-1) + 6n - 3$

Recursive: N/A

x	y
1	3
2	15
3	35
4	63
5	99
6	143
7	195

+20
+8
+28
+8
+36
+8
+44
+8
+52
+8

x	y
-3	-16
-2	-10
-1	-4
0	2
1	8
2	14

+6
+6
+6
+6
+6
+6

x	y
-5	-24
-4	-15
-3	-8
-2	-3
-1	0
0	1

+9
+2
+7
-2
+5
-2
+3
-2
+1
-2
-1
0

Pattern Type: Quadratic
Why? 1st difference is linear + 2nd difference is constant

Pattern Type: Linear
Why? 1st difference is constant

Pattern Type: Quadratic
Why? 1st difference is linear + 2nd difference is constant

Explicit: $y = 4x^2 - 1$

Explicit: $y = 6x + 2$

Explicit: $y = -x^2 + 1$

Recursive: $f(1) = 3$
 $f(n) = f(n-1) + 8n - 4$

Recursive: $f(1) = 8$
 $f(n) = f(n-1) + 6$

Recursive: $f(1) = 0$
 $f(n) = f(n-1) - 2n + 1$