

3/27 Algebra 1 - Downing

Half sheet Review:

Solve by factoring: $6x^2 - 22x + 12$

$$2(3x^2 - 11x + 6)$$

$$(3x^2 - 2x)(-9x + 6)$$

$$x(3x - 2) - 3(3x - 2)$$

$$2(x - 3)(3x - 2)$$

$$\begin{array}{r} a.c \\ 18 \\ 1 \overline{) 18} \\ -2 \overline{) 9} \end{array}$$

$$\begin{array}{r} x - 3 = 0 \\ +3 \quad +3 \\ \hline x = 3 \end{array} \quad \begin{array}{r} 3x - 2 = 0 \\ +2 \quad +2 \\ \hline 3x = 2 \\ \frac{3x}{3} = \frac{2}{3} \\ \hline x = \frac{2}{3} \end{array}$$

Linear Functions * Graph is a straight line * Constant rate of change

x	0	3	6	9	15	y	-2	-2	-2	-4
y	9	7	5	3	-1	x	$\frac{-2}{3}$	$= \frac{-2}{3}$	$= \frac{-2}{3}$	$= \frac{-4}{6}$

reduces to $-\frac{2}{3}$
all the rates are the same

$y = -\frac{2}{3}x + 9$ Equation of this line

Quadratic Functions

x	0	1	2	3	4
y	0	1	4	9	16

1st difference: +1, +3, +5, +7
2nd difference is the same on a quadratic: +2, +2, +2

Is it Linear, Quadratic or Neither?

Ex)

x	-2	-1	0	1	2
y	-9	-2	-1	0	7

Not Linear (Neither)
Not the same

Ex)

x	-2	-1	0	1	2
y	4	1	0	1	4

Not Linear (Quadratic)
2nd difference is the same

in Graphing Calculator

Ex) x | $y(f(x))$ is it Linear, Quadratic or Neither?

+1	1	2	} +4
	2	6	
+1	3	10	} +4
	4	14	
+1	5	18	} +4
	6	22	

★ it is Linear
 $y = 4x - 2$

Ex) x | $f(x)$

★ it is Quadratic

+1	-2	12	} -9	} +6
	-1	3		
+1	0	0	} +3	} +6
	1	3		
+1	2	12	} +9	} +6
	3	27		

$f(x) = ax^2 + bx + c$

$a = 3$

$b = 0$

$c = 0$

$y = 3x^2$

Ex) A quadratic has points at $(2, 4)$, $(-1, 0)$ and $(5, 0)$
 Write the function through these points.

x	y
2	4
-1	0
5	0

$y = -.44x^2 + 1.78x + 2.22$

3/27 Algebra 1 (cont)

Finding the Vertex

Steps

Example

① Find the AOS

$$x = \frac{-b}{2a}$$

$$f(x) = 2x^2 - 4x + 5$$

$$x = \frac{4}{2(2)} = \frac{4}{4} = 1$$

* a is positive \rightarrow opens up
 \rightarrow has a minimum.

② Plug in AOS

into function

for x to find y

$$f(1) = 2(1)^2 - 4(1) + 5$$

$$f(1) = 3$$

③ Write vertex

as an ordered pair

(1, 3)

Ex)

$$g(x) = -2x^2 - 4x$$

* opens down * max

$$x = \frac{4}{2(-2)} = \frac{4}{-4} = -1$$

Vertex = (-1, 2)

$$g(-1) = -2(-1)^2 - 4(-1)$$

$$g(-1) = 2$$

Ex)

$$h(x) = 2(x+2)(x-2)$$

$$(2x+4)(x-2)$$

$$2x^2 - 4x + 4x - 8$$

$$h(x) = 2x^2 - 8 \quad * \text{Opens up min at } -8$$

$$x = \frac{-0}{2(2)} = 0$$

Vertex = (0, -8)

$$h(0) = 2(0)^2 - 8$$

$$h(0) = -8$$