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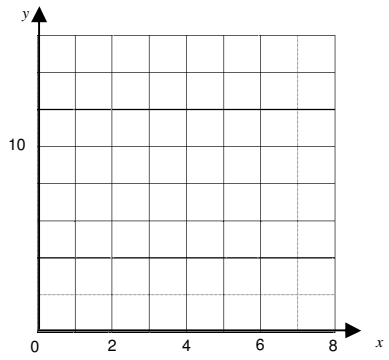
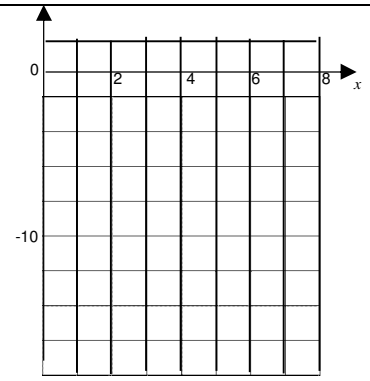
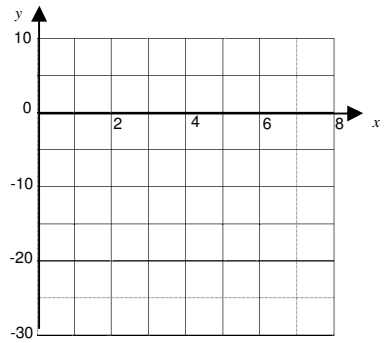
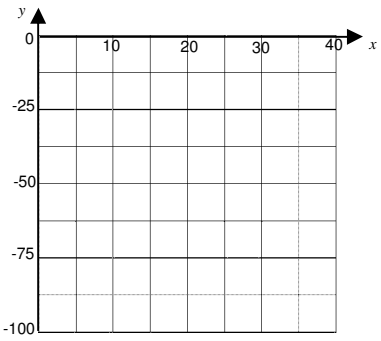
Modelling Quadratic Relations

Complete the chart below.

EQUATION	TABLE OF VALUES	GRAPH
The distance travelled by a boy on a bike is modelled by the equation $y = 3x$.	x | $3x$ | y | 1st | 2nd 0 | $3(0)$ | 0 | 3 - 0 = 3 | 3 - 3 = 0 1 | $3(1)$ | 3 | 6 - 3 = 3 | 3 - 3 = 0 2 | $3(2)$ | 6 | 9 - 6 = 3 | 3 - 3 = 0 3 | $3(3)$ | 9 | 12 - 9 = 3 | 4 | $3(4)$ | 12 | |	
The height of a falling marble is recorded and modelled by the equation $y = -5x + 2$.	x | $-5x+2$ | y | 1st | 2nd 0 | $-5(0)+2$ | 2 | | 1 | $-5(1)+2$ | | | 2 | $-5(2)+2$ | | | 3 | $-5(3)+2$ | | | 4 | $-5(4)+2$ | | |	
The height of a ball thrown by a child is modelled by the equation $y = -2x^2 + 8$.	x | $-2x^2+8$ | y | 1st | 2nd 0 | $-2(0)^2+8$ | 8 | | 1 | $-2(1)^2+8$ | | | 2 | $-2(2)^2+8$ | | | 3 | $-2(3)^2+8$ | | | 4 | $-2(4)^2+8$ | | |	
The depth of a submarine is tracked and modelled by the equation $y = x^2 - 30x + 125$.	x | $x^2-30x+125$ | y | 1st | 2nd 5 | $(5)^2-30(5)+125$ | 0 | | 10 | $(10)^2-30(10)+125$ | | | 15 | $(15)^2-30(15)+125$ | | | 20 | $(20)^2-30(20)+125$ | | | 25 | $(25)^2-30(25)+125$ | | |	

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A **MATHEMATICAL MODEL** is a mathematical description of a real situation.

Use the real-life models you completed to **SUMMARIZE** the differences between ***linear*** and ***quadratic*** relations.

Type of Mathematical Model	Linear Relations	Quadratic Relations
EQUATION *OR* *DEGREE*		
TABLE OF VALUES *OR* *DIFFERENCE TABLE*		
GRAPH *OR* *DIAGRAM*		

Example 1

Examine each equation. Determine the **degree** and the **type of relation** it represents (linear, quadratic or neither).

$y=-5x+18$	$y=6x^3+2x-1$	$y=2x^2+7x-1$
Degree: _____	Degree: _____	Degree: _____
Type: _____	Type: _____	Type: _____

Example 2

Complete each table. Determine the **type of relation** it represents. Give a **reason** for your answer.

x	$-2x+1$	y	1st	2nd
-4	$-2(-4)+1$			
-2	$-2(-2)+1$			
0	$-2(0)+1$			
2	$-2(2)+1$			
4	$-2(4)+1$			

Type: _____

Reason: _____

x	$2x^2-3$	y	1st	2nd
-2	$2(-2)^2-3$			
-1	$2(-1)^2-3$			
0	$2(0)^2-3$			
1	$2(1)^2-3$			
2	$2(2)^2-3$			

Type: _____

Reason: _____

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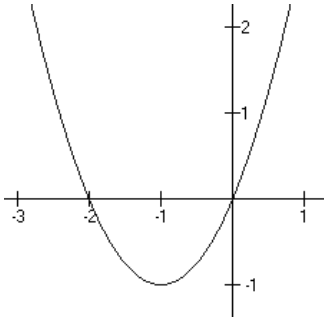
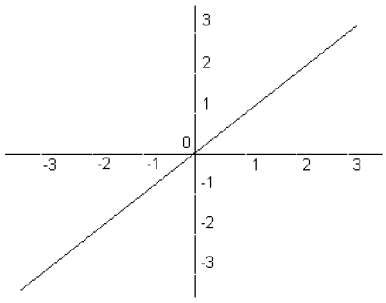
Example 3

Examine each graph. Determine the **type of relation** it represents. Give a **reason** for your answer.



Type: _____

Reason: _____



Type: _____

Reason: _____