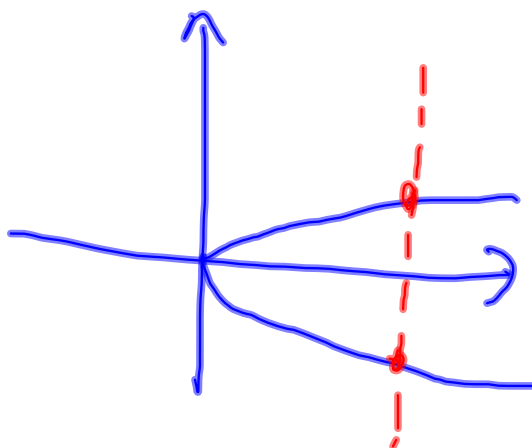


Homework Correction: p.30 #1-5

2. a) inverse :

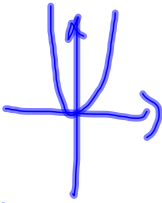

x	y
63	-3
28	-2
7	-1
0	0
7	1
28	2
63	3

b)



c) Function?

No

3. a) $7x^2$ (biggest "a") 
- b) $-0.5x^2$ (smallest "a") 
- c) $2.5x^2, 7x^2$
- d) $-0.5x^2, -3.5x^2$

4.a)

	Vertex	Min.	Max.
$16x^2$:	(0,0)	0	—
$-5x^2$:	(0,0)	—	0
$9x^2$:	(0,0)	0	—
$-3x^2$:	(0,0)	—	0

- b) conjecture:
- when $a > 0$ (positive)
min = 0 no max.
 - when $a < 0$ (negative)
no min. max = 0
 - vertex is always (0,0)

5. A: $6x^2$ (4)
 B: $12x^2$ (3)
 C: $-5x^2$ (2)
 D: $0.5x^2$ (1)

Goal:

- find the **equation/rule** for any **second-degree polynomial function** (with vertex at $(0,0)$)

Remember:

The **rule** for any **second-degree polynomial function** can be written as:

$$y = ax^2$$

where "a"
can be
any number
other than zero

So the only **parameter** we need to find is "a".

The question is how?...

Steps to find the rule:

1. Identify an ordered pair (x, y) (can't be $(0, 0)$)
2. Plug x and y into $y = ax^2$
3. Solve for "a" (most involved step)
4. Write the rule

Ex: A second-degree polynomial function has a vertex at (0,0) and passes through the point (3, -27). Write the rule that describes this function.

1. $(3, -27)$

2. $y = ax^2$

$$-27 = a(3)^2$$

3. $-27 = a(9)$

$$\frac{-27}{9} = \frac{9a}{9}$$

$$-3 = a$$

4. $y = -3x^2$

Once the rule is known problems can be solved by determining x or y if you are given the other coordinate.

Ex: Any object speeds up as it falls. The distance the object falls over time can be represented using a second-degree polynomial function.

In the absence of wind resistance an object will fall 19.6 metres in 2 seconds.

a) How far will an object fall in 4 seconds?

b) How long has an object been falling if it has fallen 207 m?

1. $(2, 19.6)$

2. $y = ax^2$

$$19.6 = a(2)^2$$

3. $19.6 = a(4)$

$$\frac{19.6}{4} = \frac{4a}{4}$$

$$4.9 = a$$

4. $y = 4.9x^2$

a) $x = 4$

$$y = ?$$

$$y = 4.9(4)^2$$

$$= 4.9(16)$$

$$= 78.4 \text{ m}$$

b) $y = 207 \quad x = ?$

$$\frac{207}{4.9} = \frac{4.9x^2}{4.9}$$

$$\sqrt{42.2} = \sqrt{x^2}$$

$$6.5 = x$$

6.5 seconds

Homework : Handout 4.2
1-4