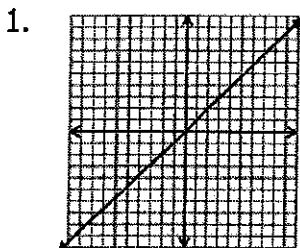**Parent Function Intro**   Name __*Key*__   Pd____
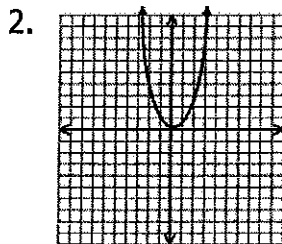
Match the name & equation to the graph.

Names: A) absolute value   B) cubic   C) linear   D) quadratic   E) radical
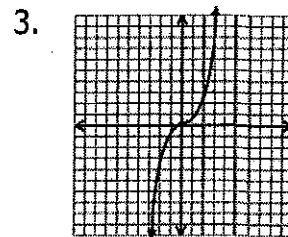
Equations: F) $y = x$ G) $y = x^2$ H) $y = x^3$ I) $y = |x|$ J) $y = \sqrt{x}$
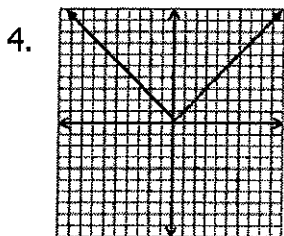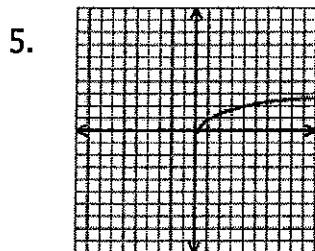
1.   C/F

2.   D/G

3.   B/H

4.   A/I

5.   E/J

For #11-13 use → $y = a(x-h)^2 + k$ ←   *compress would be 1/a*

__it stretches/makes skinnier__   11) describe the effect of **a** on the graph.

__moves right "h" units__   12) describe the effect of **h** on the graph.

__moves up "k" units__   13) describe the effect of **k** on the graph.

Identify the parent function name and describe the transformation for each function.

6. $g(x) = 3(x-1)^2 - 6$ Name: __Quadratic__

Transformation: 1) __Stretched by 3__   2) __Right 1__   3) __Down 6__
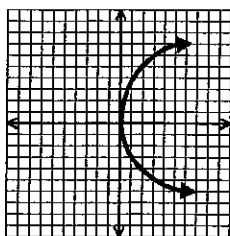
7. $f(x) = 5(x-2)^3 - 11$ Name: __Cubic__

Transformation: 1) __Stretch by 5__   2) __Right 2__   3) __Down 11__

8. $h(x) = \frac{2}{3}|x+6|$ Name: __Absolute value__   Transformation 1) __Compress 2/3__   2) __Left 6__
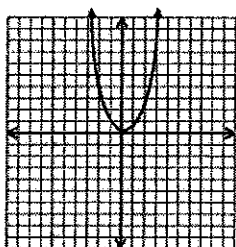
9. $f(x) = x + 6$ Name: __Linear__   Transformation 1) __Up 6__

10. What is the effect on the graph of the function $y = x^2 + 2$ when it is changed to $y = x^2 - 3$? __Move 5 down__

Is it a function?   11-14

NO

Yes

x	y
-13	-1
-5	0
-2	2
0	2
1	5

→ y can repeat, x can't

yes

x	y
-1	-1
0	0
1	1
2	2
4	5
4	7

x cant repeat, y diff. → NO

Describe how each function is transformed from its parent function

15) $g(x) = (x + 2)^2 - 1$ Transformation(s): *Left 2, down 1*

16) $f(x) = \frac{1}{2}|x - 1|$ Transformation(s): *Compressed ½, Right 1*

Given the parent function and a description of the transformations, write the equation of the transformed function f(x).

17) Absolute value—vertical shift up 5, horizontal shift right 3 $y = |x - 3| + 5$

18) Linear—vertical compression by 2/5 $2/5 \, x$

19) Square root—vertical shift down 2 $\sqrt{x} - 2$

20) Quadratic—vertical stretch by 5, horizontal shift left 8 $5(x + 8)^2$

21) Cubic—vertical stretch by 3/2, horizontal shift 2 units left, vertical shift up 1 $\frac{3}{2}(x + 2)^3 + 1$

22) Reciprocal—horizontal shift 1 unit right $\dfrac{1}{x - 1}$

VS.
$\dfrac{1}{x} - 1$
*would
go down
1*

23) Cube root—vertical compression by 2/3, vertical shift 2 units down $2/3 \sqrt[3]{x} - 2$

____*Linear*____24) Jimmy takes 5 naps per day. Is this statement Linear or Quadratic?

____*Quadratic*____25) Steven shoots a rocket from the ground.
Is this statement Linear or Quadratic?

26) Below are tables of points for two functions. Describe the transformation. *& name the Parent Function*
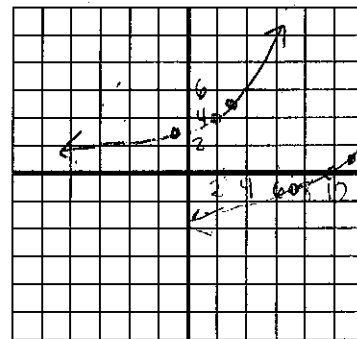
Parent function

x	y
-1	3
3	5
2	4

y - 4
y - 4
x + 8

Translated function

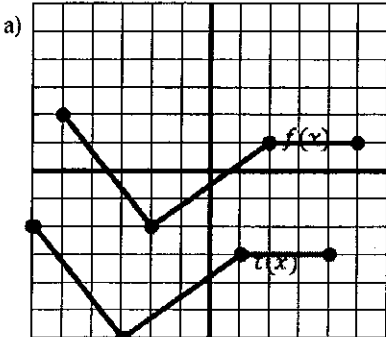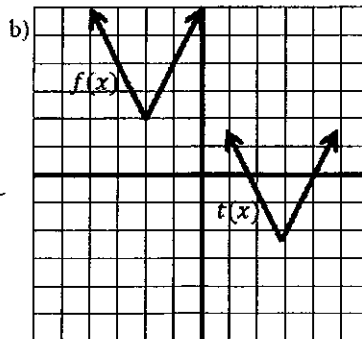| x	y
7	-1
11	1
10	0

Scale by 2

Parent Function: *Radical*

Transformation: *down 4, right 8*

27) Describe each transformation. Then write an equation for $t(x)$ in terms of $f(x)$.

a)

down 4, Left 1

$t(x) = f(x + 1) - 4$

b)

down 4.5, Right 5

$t(x) = f(x - 5) - 4.5$

What is the domain and range of f(x) for a? D: $[-5, 5]$ R: $[-2, 2]$ for b? D: $(-\infty, \infty)$ R: $[2, \infty)$

Domain and range of t(x) for a? D: $[-6, 4]$ R: $[-4, -2]$ for b? D: $(-\infty, \infty)$ R: $[-2.5, \infty)$

about