1d) $\frac{4(x+1)}{5} = \frac{2}{3}(x-6)$

$\left[\frac{4}{5}(x+1) = \frac{2}{3}(x-6)\right]15$

$\cancel{15}^{3}\left(\frac{4}{\cancel{5}}\right) = \frac{60}{5} = 12$

$12(x+1) = 10(x-6)$

$12x+12 = 10x-60$

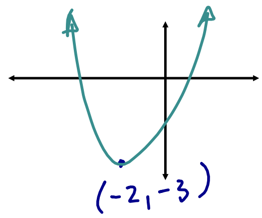
2c) $4(x+2)^2 - 3 = 0$

$\frac{4(x+2)^2}{4} = \frac{3}{4}$

$\sqrt{(x+2)^2} = \pm\sqrt{\frac{3}{4}}$

$x+2 = \pm\frac{\sqrt{3}}{2}$

$x = -2 \pm \frac{\sqrt{3}}{2}$



3a) $|x-10| = x^2-10x$

Case 1: $x-10 = x^2-10x$

$0 = x^2-11x+10$

$0 = (x-1)(x-10)$

$\cancel{x=1}$ $\boxed{x=10}$

check

$x=1: |-9| \neq -9$ ✓

$x=10: 0=0$

$x=-1: |-11| = 11$ ✓

Case 2: $-(x-10) = x^2-10x$

$-x+10 = x^2-10x$

$0 = x^2-9x-10$

$0 = (x-10)(x+1)$

$\boxed{x=10}$ $\boxed{x=-1}$

$\boxed{x \neq \pm 3}$

d) $\frac{6}{(x-3)}\frac{(x+3)}{(x+3)} = \frac{x+3}{(x+3)(x-3)} - \frac{5(x+3)(x-3)}{(x+3)(x-3)}$

$6x+18 = (x+3) - 5(x^2-9)$

$6x+18 = x+3-5x^2+45$

$(5x^2+5x-30=0)\div 5$

$x^2+x-6=0$

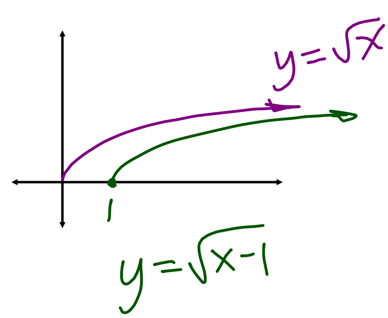
$(x+3)(x-2)=0$

$\cancel{\boxed{x=-3}}$ $\boxed{x=2}$

$y = (x+1)^2-3$

$y+3 = (x+1)^2$

vertex $(-1,-3)$



Chapter 1: Function Transformations

1.1 Horizontal and Vertical Transformations

Key words : Copy these definitions from the text pg. 7

- Transformation : a shift or change in shape that is applied to a graph
- Mapping : the relating of one set of points to another as a result of a transformation
- Translation : a slide transformation (cut and paste) → congruency is maintained
- Image point : the point that is the result of a transformation

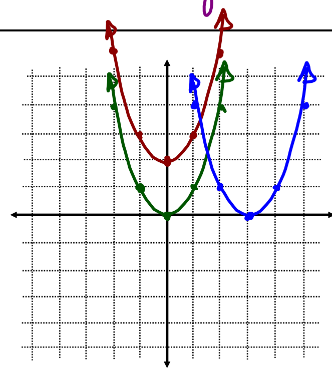
- Example 1 : page 8

$y = x^2$

$y - 2 = x^2$

$y = x^2 + 2$

$y = (x-3)^2$

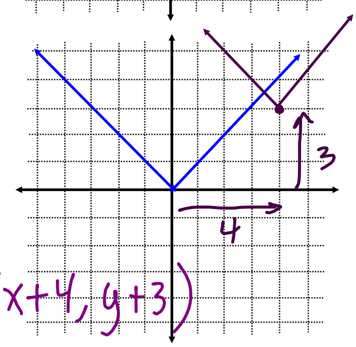


$y = a(x-h)^2 + k$

- Example 2 : page 9

$y = |x - 4| + 3$ up 3

right 4



parent: $y = |x|$

mapping notation: $(x,y) \rightarrow (x+4, y+3)$

- Example 3 : page 10 together in the book

$f(x) = x^2$

$g(x) = (x+4)^2 - 5$ or $y + 5 = (x+4)^2$

HOMEFUN : pg. 12 #5, 7-11, 17, 19, C4

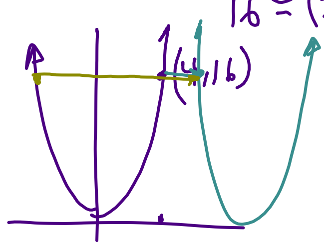
$\boxed{(x,y) \rightarrow (x-4, y-5)}$

$y = f(x)$

$y = f(x+4) - 5$

$y = (x+h)^2$

$16 = (5+h)^2$

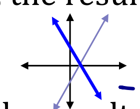


1.2 Reflections and Stretches

- **Reflection**: produces a mirror image with respect to an axis called axis of reflection. The image is congruent to the original function. Hence, we call reflections and translations isometric transformations.
- **Invariant Point**: A point that remains unchanged after a transformation. Any point on a curve that lies on the axis of reflections is invariant.

Example 1 : page 18 together

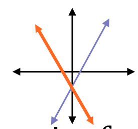
➢ when the output values (y) of a function are multiplied by -1, the result, $y = -f(x)$, is a reflection of the graph in the x-axis.



$-f(x)$

➢ when the input values (x) of a function are multiplied by -1, the result, $y = f(-x)$, is a reflection of the graph in the y-axis.

✓ Your turn pg. 20 ⟶ $f(x) = 2x + 2$



$f(-x)$

- **Stretch**: A transformation in which the distance of each point from the stretch axis is multiplied by some scale factor. If $0 < factor < 1$ the point approaches the stretch axis; if the $factor > 1$ the image is moved further from the stretch axis.

Example 2 : page 21 together

➢ When the output values (y) are multiplied by a non-zero constant, a, the result is a vertical stretch by a factor of $|a|$ with respect to the x-axis. If $a < 0$, there is also a reflection over the x-axis.

✓ Your turn pg. 22

Example 3 : page 31 together

➢ When the input values (x) are multiplied by a non-zero constant, b, the result is a horizontal stretch by a factor of $|1/b|$ with respect to the y-axis. If $b < 0$, there is also a reflection over the y-axis.

✓ Your turn pg. 24

Example 4 : page 25 together

✓ Your turn pg. 27

$g(x) = f(2x)$

or $g(x) = 4f(x)$

Homefun : pg. 28 #5-10, 12, 14, C2, C3

Quiz in 2 days on 1.1 & 1.2