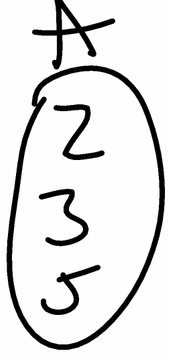
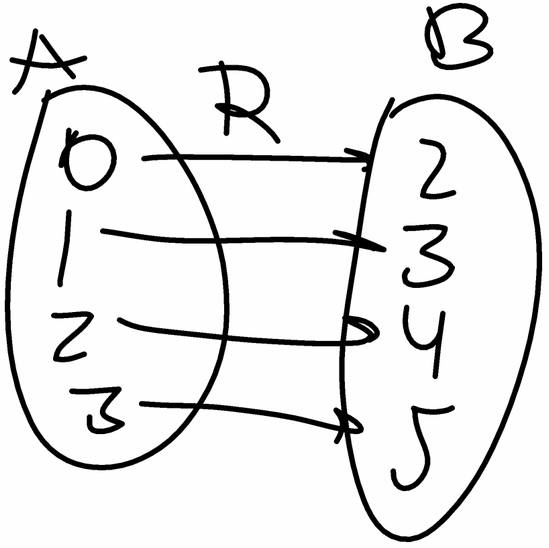
G11 F&A REVIEW 2

Q1: Write the set of fig



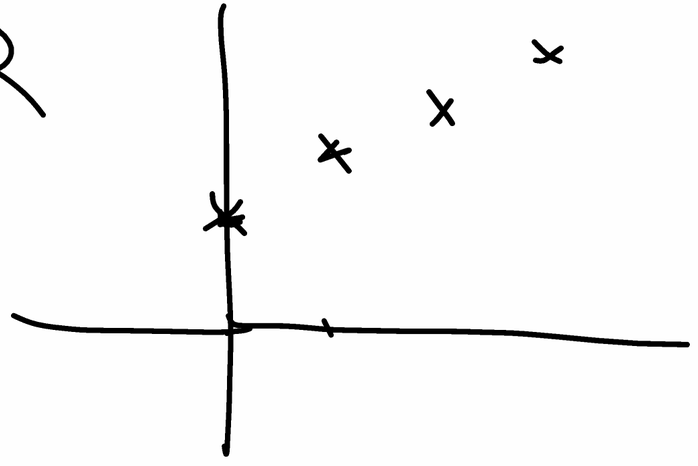
$A = \{2, 3, 5\}$

Q2 Write the expression of relation R:



$R = \{(0,2), (1,3), (2,4), (3,5)\}$

Q3: Graph relation R



Q4: State Domain & Range of R

$Range(R) = \{2,3,4,5\}$

$Dom(R) = \{0,1,2,3\}$

Q5: Solve $3x^2 - 12x + 12 = 0$

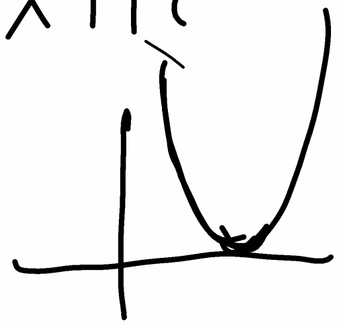
$ax^2 + bx + c = 0$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \frac{12 \pm \sqrt{12^2 - 4 \cdot 3 \cdot 12}}{2 \cdot 3} = \frac{12 \pm \sqrt{144 - 144}}{6} =$

$= \frac{12}{6} = 2$

Q6.- How many zeros does $f(x) = 3x^2 - 12x + 12$ has? Find them. $f(x) = 0$ $x = 2$



∴ **Q7**: Sketch f(x)

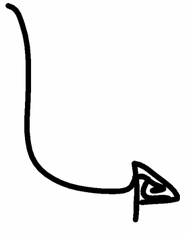
Q5: Write a quadratic function in

a) standard form $f(x) = 7x^2 - 5x + 3$

b) vertex form $g(x) = \frac{1}{2}(x+7)^2 - 2$

c) Factor form $h(x) = 3(x-1)(x+2)$

Q6:- Write $f(x)$ in vertex form



Q6: Write $f(x) = 7x^2 - 5x + 3$ in vertex form

Sol:

$(x+a)^2 = x^2 + 2ax + a^2$

$= (x+a)(x+a) = x^2 + ax + ax + a^2$

$(x-a)^2 = x^2 - 2ax + a^2$

$= (x-a)(x-a) = x^2 - ax - ax + a^2$

$f(x) = 7x^2 - 5x + 3 =$

$= 7\left[x^2 - \frac{5}{7}x + \frac{3}{7}\right]$ (step 1)

$= 7\left[(x-a)^2 - a^2 + \frac{3}{7}\right]$ (step 2)

(step 3) $2a = \frac{5}{7} \rightarrow a = \frac{5}{2 \cdot 7} = \frac{5}{14}$

(step 4) $= 7\left[\left(x - \frac{5}{14}\right)^2 - \frac{5^2}{14^2} + \frac{3}{7}\right] =$

$$= 7\left[\left(x-\frac{5}{14}\right)^2 - \frac{5^2}{14^2} + \frac{3}{7}\right] =$$

$$= 7\left(x-\frac{5}{14}\right)^2 - 7\cdot\frac{5^2}{14^2} + \cancel{7}\cdot\frac{3}{\cancel{7}} = 7\left(x-\frac{5}{14}\right)^2 - \frac{25}{28} + 3 =$$

$$\frac{7\cdot 5^2}{14^2} = \frac{7\cdot 25}{14\cdot 14} = \frac{\cancel{7}\cdot 25}{\cancel{7}\cdot 2\cdot 14} = \frac{25}{28}$$

$$= 7\left(x-\frac{5}{14}\right)^2 + \frac{59}{28}$$

Vertex form of $f(x)$

$$-\frac{25}{28} + 3 = \frac{-25}{28} + \frac{84}{28} = \frac{59}{28}$$

Q7 $g(x)=\frac{1}{2}(x+7)^2-2$ Write it in standard form

Sol: Expand the square: $(x+7)^2=(x+7)(x+7)=$

$=x^2+7x+7x+49=x^2+14x+49$

Hence $\boxed{g(x)=\frac{1}{2}(x^2+14x+49)-2=}$

$=\frac{x^2}{2}+7x+\frac{49}{2}-2=\boxed{\frac{x^2}{2}+7x+\frac{45}{2}}$ Standard form

$\frac{49}{2}-2=\frac{49}{2}-\frac{22}{2}$

$=\frac{45}{2}$

Q8. $h(x) = 3(x-1)(x+2)$ Write in Standard form

Sol: We expand the product: $(x-1)(x+2) = x^2+2x-x-2 =$

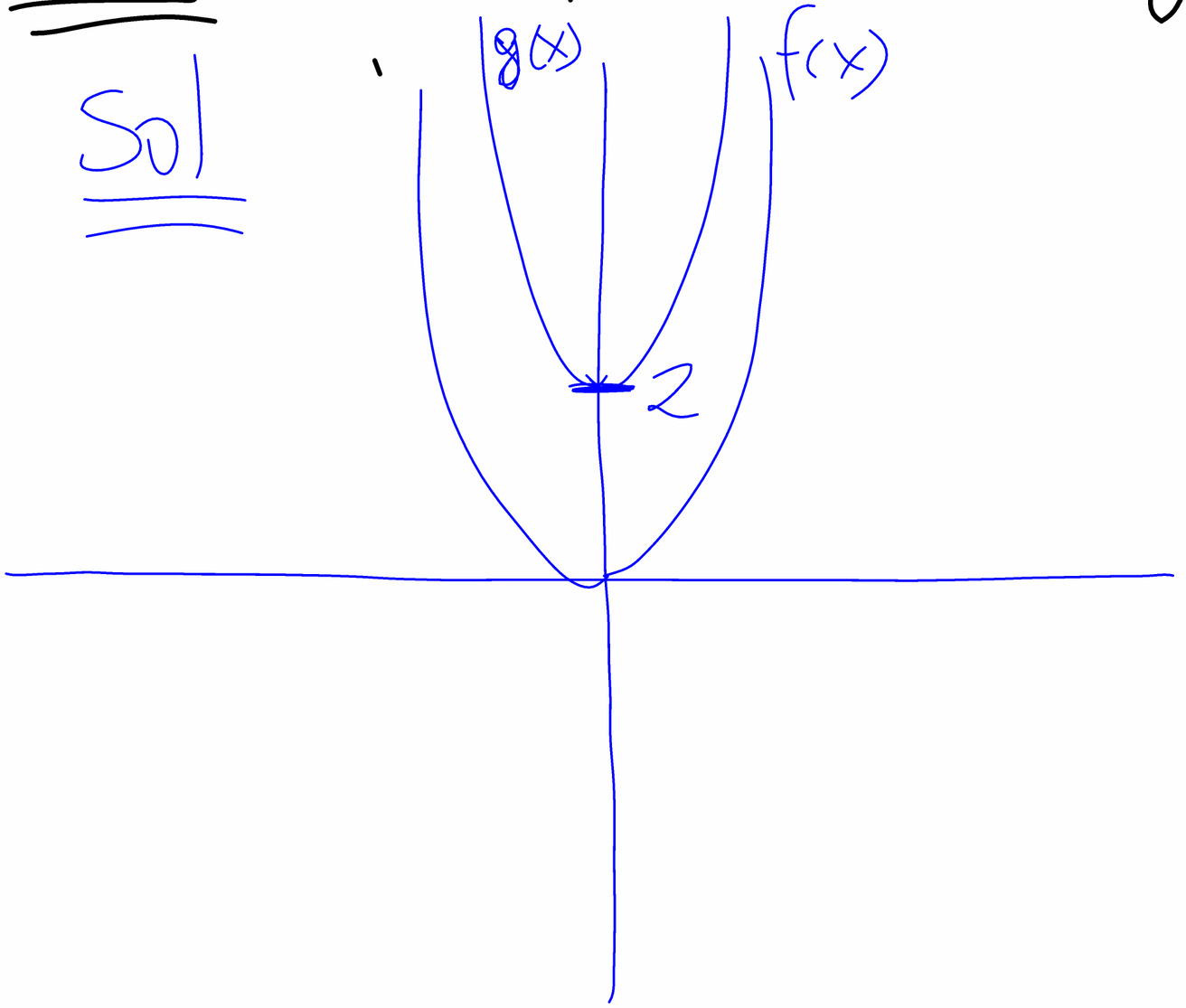
$= x^2+x-2$

Hence, $h(x) = 3(x^2+x-2) =$

$= 3x^2+3x-6$ Standard form

Q9: Sketch $f(x)=x^2$ & $g(x)= x^2+2$

Sol



Q10: Given the plot of $f(x) = x^2$, sketch $g(x) = (x-3)^2$

Sol