$$S = 1 + 2 + \dots + n-1 + n$$

$$S = n + n-1 + \dots + 2 + 1$$

$$2S = (n+1) + (n+1) + \dots + (n+1)(n+1)$$

$$2S = n(n+1)$$

$$S = n(n+1)/2$$

$P(n) = \sum_{i=1}^{n} i = n(n+1)/2$

$P(0) = \sum_{i=1}^{0} i = \frac{0(0+1)}{2} = 0$

$P(n) = \sum_{i=1}^{n} i = n(n+1)/2$

$P(n+1) = \sum_{i=1}^{n+1} i = (n+1)(n+2)/2$

$\sum_{i=1}^{n+1} i = \sum_{i=1}^{n} i + (n+1)$

$= \frac{n(n+1)}{2} + (n+1)$

$= \frac{n(n+1) + 2(n+1)}{2}$

$= \frac{(n+1)(n+2)}{2}$

Domain and range

D: {-4, 1, 2, 3}
R: {3, 4, 5, 6}

D: {-3, -1, 4, 5, 6}
R: {1, 2, 6, 8, 9}

D: {-2, 2, 3, 5, 8}
R: {-5, 3, 7, 8}

Function or Not?

$y = 2x - 3$ → Function

$y = x^2$ → function

$x = y^2$ → not a function

Function Notation

$f(x) = 2x - 5$

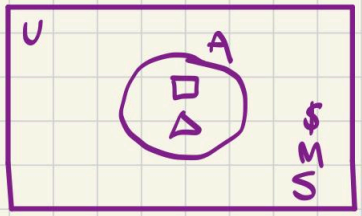
find $f(3)$

$f(3) = 2(3) - 5$

$= 1$

$(3, 1)$

Universal Sets



a. $U = \{O, \Delta, \$, M, S\}$

b) $A = \{O, \Delta\}$

c) $\{\$, M, S\}$

Venn Diagram

a) $U = \{a, b, c, d, e, f, g\}$

b) $B = \{d, e\}$

c) $\{a, b, c\}$

d) $\{a, b, c, f, g\}$

e $\{d\}$

Intersection

a) $\{7, 8, 9, 10, 11\}$ $\{6, 8, 10, 12\}$

$= \{8, 10\}$

b) $= \varnothing$ c) $\varnothing$

Example 6

a) $A \cup B = \{1, 3, 7, 8, 9, 10\}$

$A \cup B' = \{2, 4, 5, 6\}$

b) $A' = \{2, 4, 5, 6, 8, 10\}$

$B' = \{1, 2, 4, 5, 6, 9\}$

$A' \cup B' = \{2, 4, 5, 6\}$

Example 8

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

$$= 490 + 340 - 120$$
$$= 830 - 120$$
$$= 710$$