

Tutorial 2

Question 1

a) $T \cap V$

$$T = \{ \text{Casey, drew, jade} \}$$

$$V = \{ \text{drew, jade, glen} \}$$

$$T \cap V = \{ \text{drew, jade} \}$$

b) $S' \cap T$

$$S' = \{ \text{jade, glen, blair, erin, francis, ira} \}$$

$$T = \{ \text{Casey, drew, jade} \}$$

$$S' \cap T = \{ \text{jade} \}$$

c) $(U - T) \cap S$

$$U = \{ \text{blair, erin, francis, ira, alex hunter, Casey, drew, jade, glen} \}$$

$$T = \{ \text{Casey, drew, jade} \}$$

$$(U - T) = \{ \text{blair, erin, francis, ira, alex hunter} \}$$

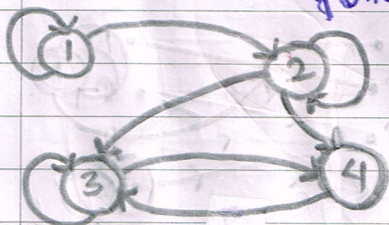
$$S = \{ \text{alex hunter, Casey, drew} \}$$

$$(U - T) \cap S = \{ \text{alex hunter} \}$$

Question 2

Consider the following relation on the set $\{1, 2, 3, 4\}$

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



i) R is not reflexive because $(4,4) \notin R$.

ii) R is not symmetric because $(2,4) \in R$ but $(4,2) \notin R$.

iii) R is transitive because whenever $a R b$, $b R c$ then $a R c$.

Question 3

a) $\lfloor 2.33 \rfloor + \lceil -0.52 \rceil$

$= 2 + 0$

$= 2$

b) $\lceil -1.3 \rceil - \lfloor 0.33 \rfloor$

$= \lceil -2 \rceil - 0$

$= \lceil -2 \rceil$

$= -2$

Question 4

The function fg and f are given by $fg: x \rightarrow 6x - 1$
and $f: x \rightarrow 2 - 3x$

a) $g(x)$

$fg(x) = 6x - 1$

$2 - 3g(x) = 6x - 1$

$-3g(x) = 6x - 1 - 2$

$-3g(x) = 6x - 3$

$g(x) = \frac{6x - 3}{-3}$

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

$g(x) = -2x + 1$

b) $gf(x)$

$= g(2 - 3x) = 2$

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

$= -4 + 6x + 1$

$gf(x) = 6x - 3$