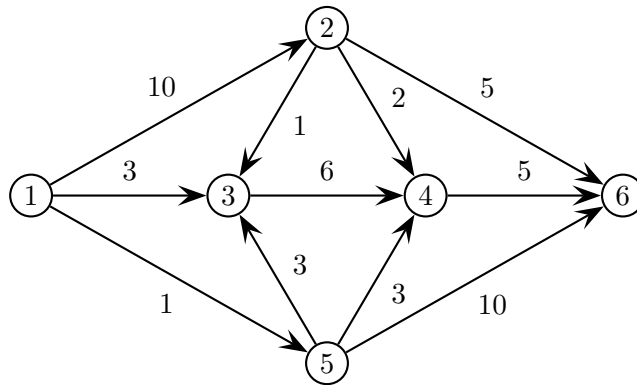


# MCS 401: Computer Algorithms I (Fall 2020)

## Homework 6

Due at 2:00pm CST, Monday, Dec 7

1. Consider the following (directed) graph  $G = (V, E)$  with capacities  $c_e$  given on each edge. Let  $s = 1$  and  $t = 6$ .



- (a) Find a maximum  $s$ - $t$  flow in  $G$ . What is the value of this flow?
  - (b) Find a minimum (directed)  $s$ - $t$  cut in  $G$ . What is the value of this cut?
2. Decide whether the following statements are true or false.  
(You do not have to justify your answer.)
    - (a) If  $X \leq_P Y$  and  $Y \in \mathbf{P}$ , then  $X \in \mathbf{P}$ .
    - (b) If  $X \leq_P Y$  and  $X$  is **NP**-complete, then  $Y$  is **NP**-complete.