Problem 1. Fill in the blanks with answers based on the graph in Figure 1.

The maximum flow from $v_1$ to $v_6$ is ________.

The maximum flow from $v_2$ to $v_5$ is ________.

The removal of the edge (________, ________) cause the maximum flow from $v_3$ to $v_4$ to become 5.

The two distinct nodes with maximum flow between them are ________ and ________.
**Problem 2.** A graph is 2-connected provided it remains connected after removing any edge. Complete the following implementation of a function that returns whether a graph is 2-connected. The function `max_flow` assumes the weight/capacity of every edge in the graph `V` is 1.

```cpp
bool two_connected(vector<Node*> &V)
{
    if (V.size() <= 2)
        return true;

    Node* s = V[0];
    for (Node* t : V)
    {
        // Uses Edmonds-Karp
        int f = max_flow(V, s, t);

        if (f < 1)
            return false;
    }
    return true;
}
```

Fill in the blank: the worst-case running time of `two_connected` is \( \Theta(\text{function of } |V|, |E|) \).
**Problem 3.** Complete the labelings of the edges to obtain valid flows from $s$ to $t$.

![Figure 2: A graph for Problem 3.](image)

![Figure 3: A graph for Problem 3.](image)