

# **LABORATORY ACTIVITY NO. 13**

## **THE BLOOD VESSELS**

### **Scope of Laboratory Activity**

This laboratory activity consists of eight (8) worksheets:

- Worksheet no. 1 The Blood Vessels
- Worksheet no. 2 Structure of the Blood Vessels
- Worksheet no. 3 The Capillary Bed
- Worksheet no. 4 Systemic Arteries of the Body
- Worksheet no. 5 Major Systemic Veins of the Body
- Worksheet no.6 Pulmonary Circuit
- Worksheet no.7 Hepatic Portal System
- Worksheet no.8 Fetal Circulation

### **Overview**

The blood flows in the highways of the body which is called the blood vessels. The blood vessels are composed of big arteries and veins which serves as a major roads. Moreover, the small arteries veins are spread throughout the tissues. The capillaries serves as the back alleys and driveways where the blood is delivered to and collected from the individual cells.

### **Objectives**

After completing this laboratory activity, the student will be able to:

1. Describe blood vessel and cardiovascular circulation.
2. Differentiate structures of arteries and veins.
3. Identify the major arteries and veins of the human body.
4. Describe the pulmonary circulation.
5. Describe the hepatic portal system
6. Identify the special fetal structures and describe changes in fetal circulation after birth.

### **Materials**

Models or Charts of Human arteries and veins

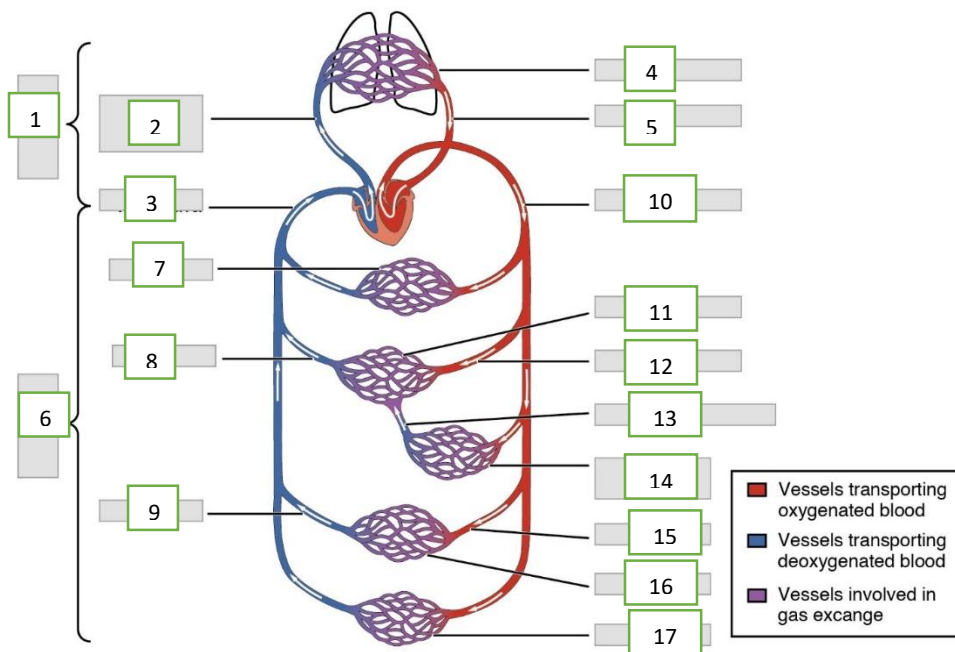
Worksheet no. 1 **The Blood Vessels**

1.1 Complete the following statements concerning blood vessels.

The central cavity of a blood vessel is called (1) \_\_\_\_\_. Reduction of the diameter of this cavity is called (2) \_\_\_\_\_, and enlargement of the vessel diameter is called (3) \_\_\_\_\_. Blood is carried to the heart by (4) \_\_\_\_\_ and away from the heart by (5) \_\_\_\_\_. Capillary beds are supplied by (6) \_\_\_\_\_ and drained by (7) \_\_\_\_\_.

1.2 **Cardiovascular Circulation**

Label the structure listed in figure 1 and write your answers in the space provided below.



**Figure 1 Cardiovascular Circulation**

- |          |           |
|----------|-----------|
| 1. _____ | 10. _____ |
| 2. _____ | 11. _____ |
| 3. _____ | 12. _____ |
| 4. _____ | 13. _____ |
| 5. _____ | 14. _____ |
| 6. _____ | 15. _____ |
| 7. _____ | 16. _____ |

8. \_\_\_\_\_  
 9. \_\_\_\_\_

17. \_\_\_\_\_

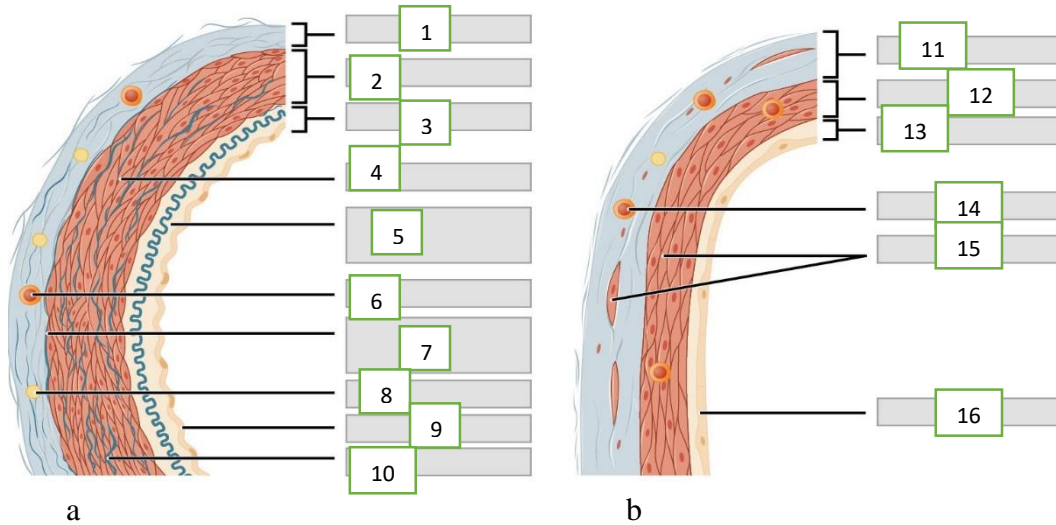
**Worksheet no. 2 Structure of the Blood Vessels**

2.1 Described in each of the following descriptions. Insert the term or letter of the key choice in the answer blanks.

- A. Tunica intima      B. Tunica media      C. Tunica externa

- \_\_\_\_\_ 1. Single thin layer of endothelium.
- \_\_\_\_\_ 2. Bulky middle coat, containing smooth muscle and elastin.
- \_\_\_\_\_ 3. Provides a smooth surface to decrease resistance to blood flow.
- \_\_\_\_\_ 4. The only tunic of capillaries.
- \_\_\_\_\_ 5. Also called the adventitia.
- \_\_\_\_\_ 6. The only tunic that plays an active role in blood pressure regulation.
- \_\_\_\_\_ 7. Supporting, protective coat.

2.2 Identify and label the layers of the blood vessels in Figure 2 and write your answers on the space provided below



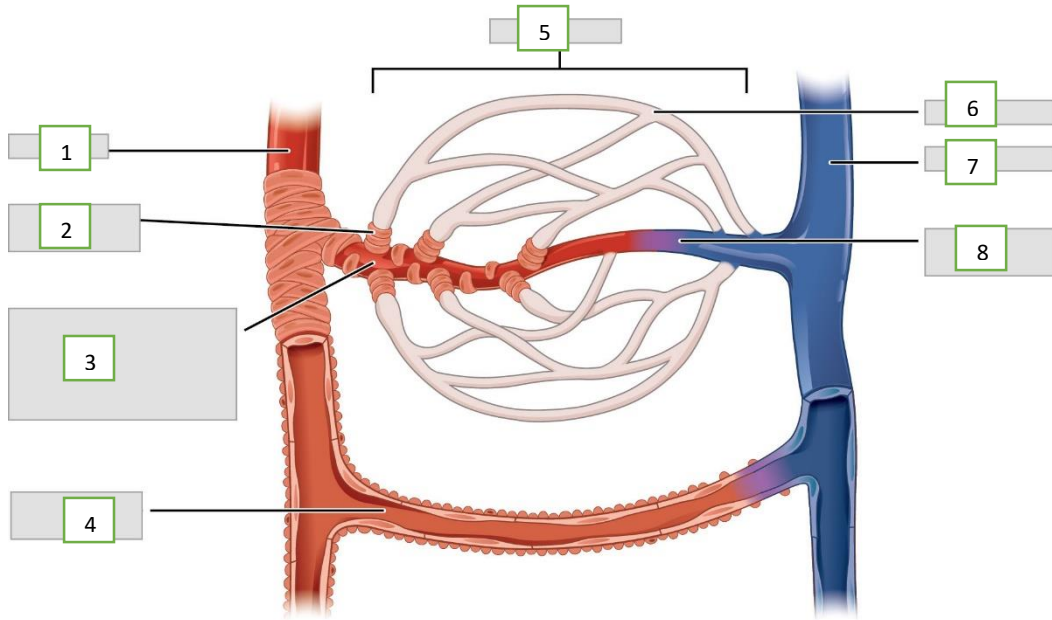
**Figure 2 (a) Arteries and (b) veins**

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_
- 7. \_\_\_\_\_
- 8. \_\_\_\_\_

- 9. \_\_\_\_\_
- 10. \_\_\_\_\_
- 11. \_\_\_\_\_
- 12. \_\_\_\_\_
- 13. \_\_\_\_\_
- 14. \_\_\_\_\_
- 15. \_\_\_\_\_
- 16. \_\_\_\_\_

### Worksheet no. 3 The Capillary Bed

Label the capillary bed in Figure 3 and write your answer on the space provided below.



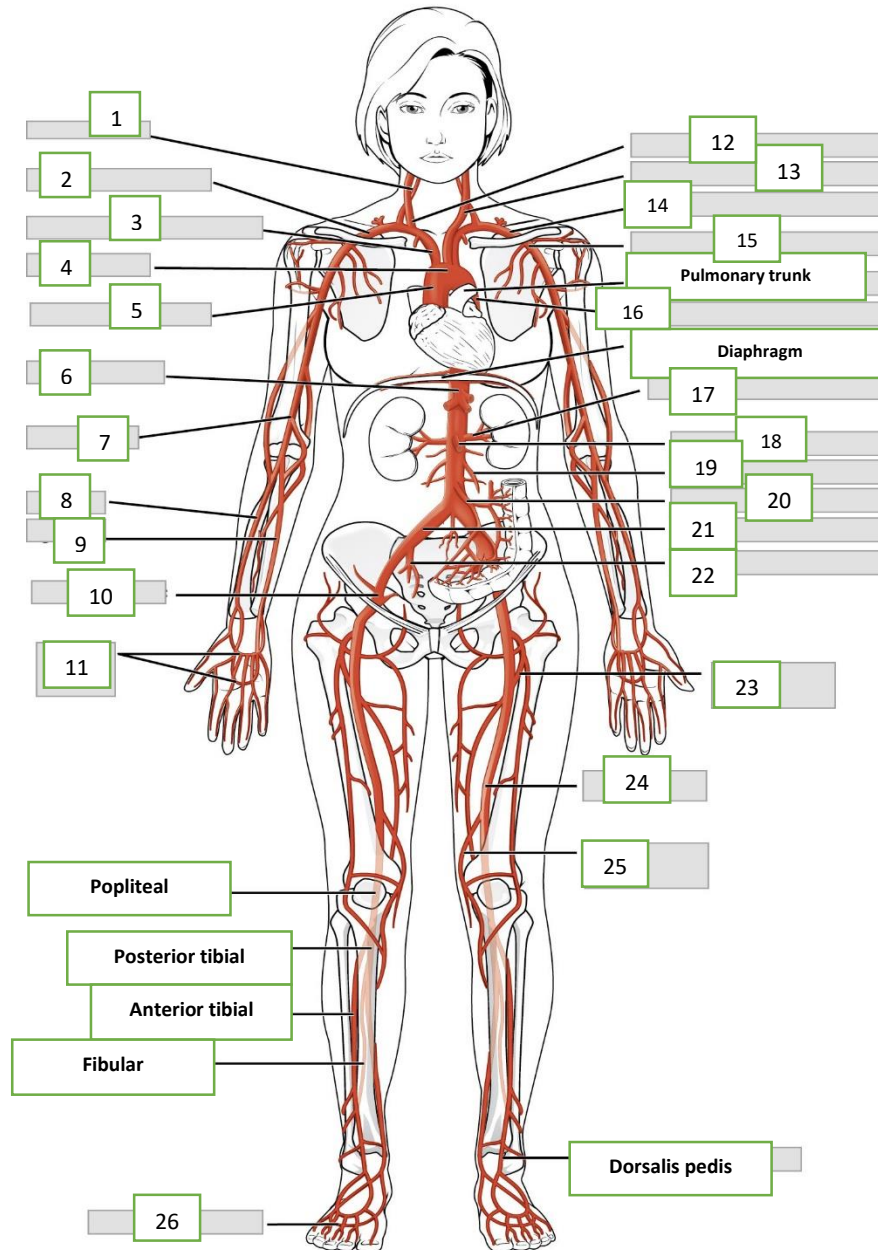
**Figure 3 Capillary Bed**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_

## Worksheet no. 4 Systemic Arteries of the Body

Label the major systematic arteries in figure 4. Write your answers on the space provided below.

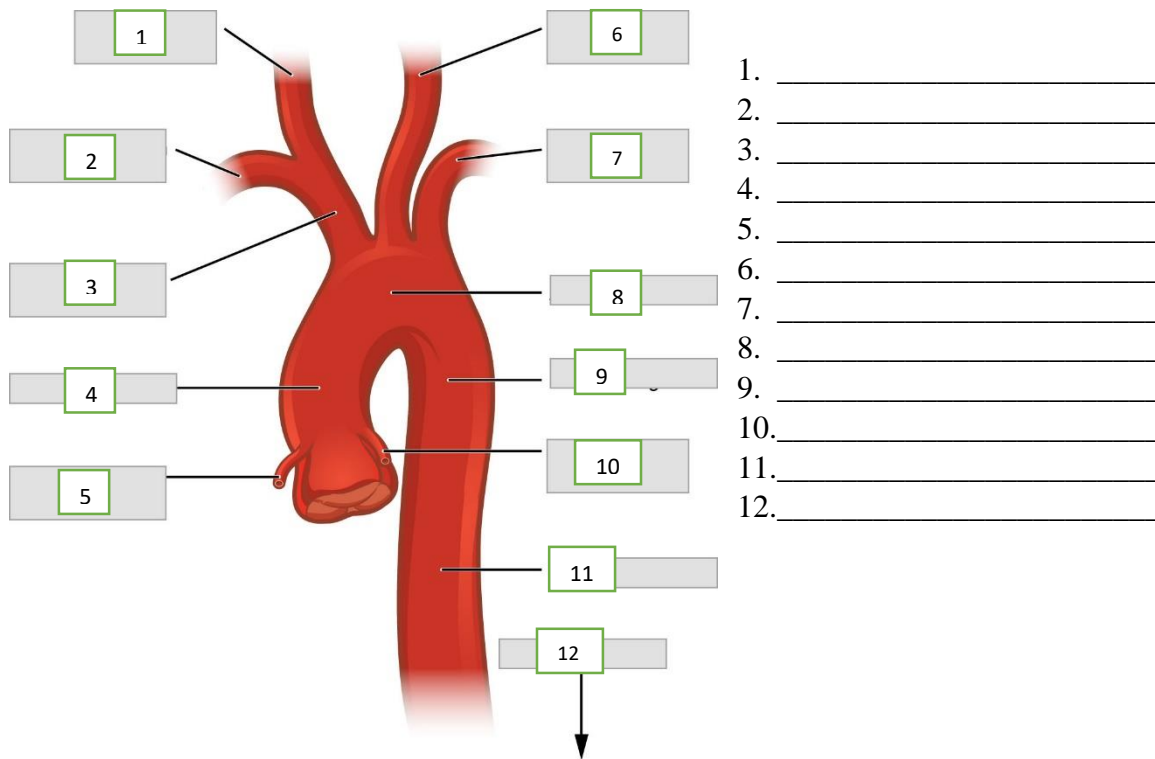


**Figure 4 Major Systemic Arteries of the Body**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_

14. \_\_\_\_\_
15. \_\_\_\_\_
16. \_\_\_\_\_
17. \_\_\_\_\_
18. \_\_\_\_\_
19. \_\_\_\_\_
20. \_\_\_\_\_
21. \_\_\_\_\_
22. \_\_\_\_\_
23. \_\_\_\_\_
24. \_\_\_\_\_
25. \_\_\_\_\_

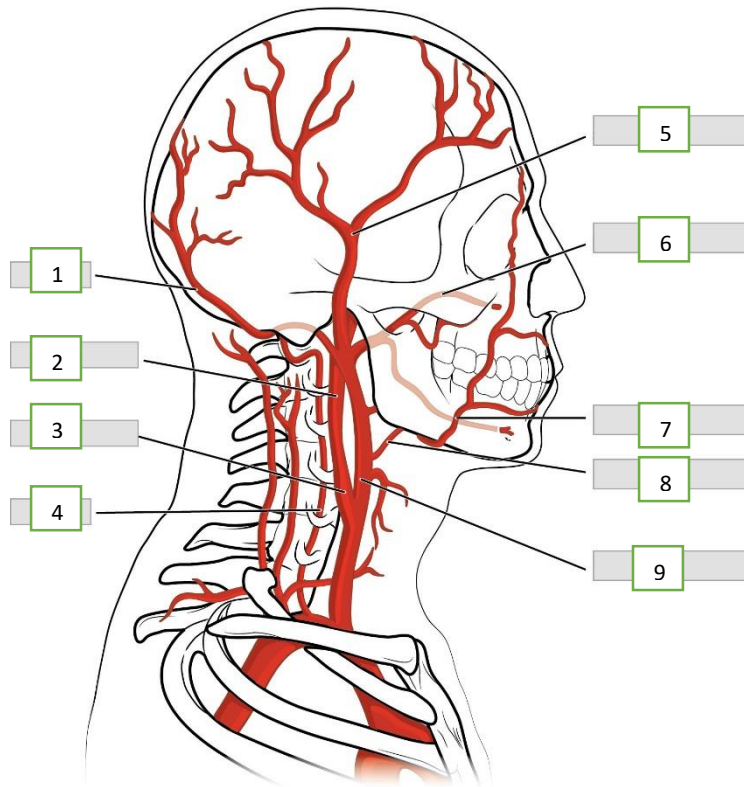
Label the arteries of the aorta in figure 5.



1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_

**Figure no. 5 Ascending aorta and aortic arch and the initial segment of the descending aorta plus major branches**

Label the arteries supplying the head and neck

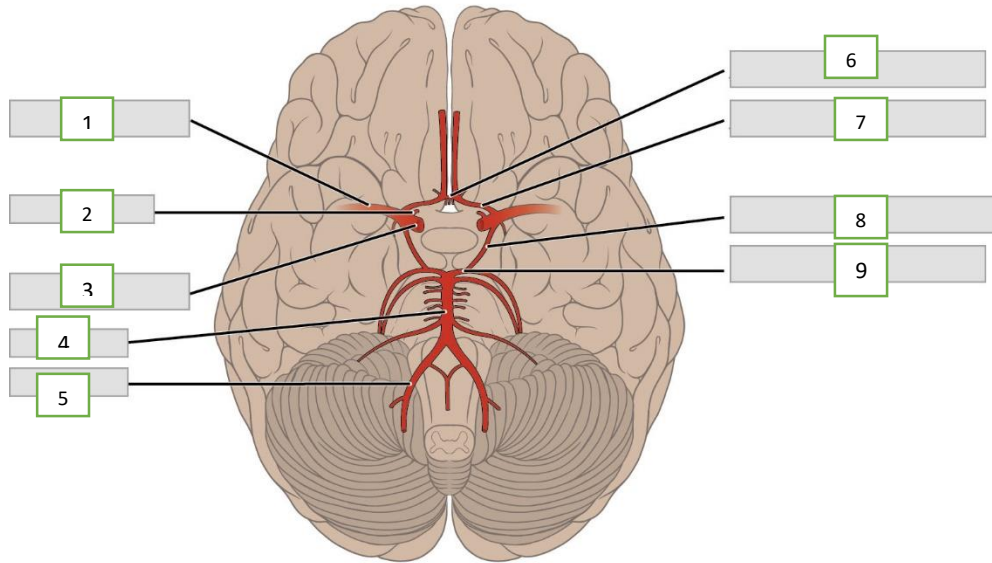


**Figure no. 6 Major Arteries Supplying the Head and Neck**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_

Label the arteries of the brain and identify the cerebral arterial circle or circle of Willis in Figure 7



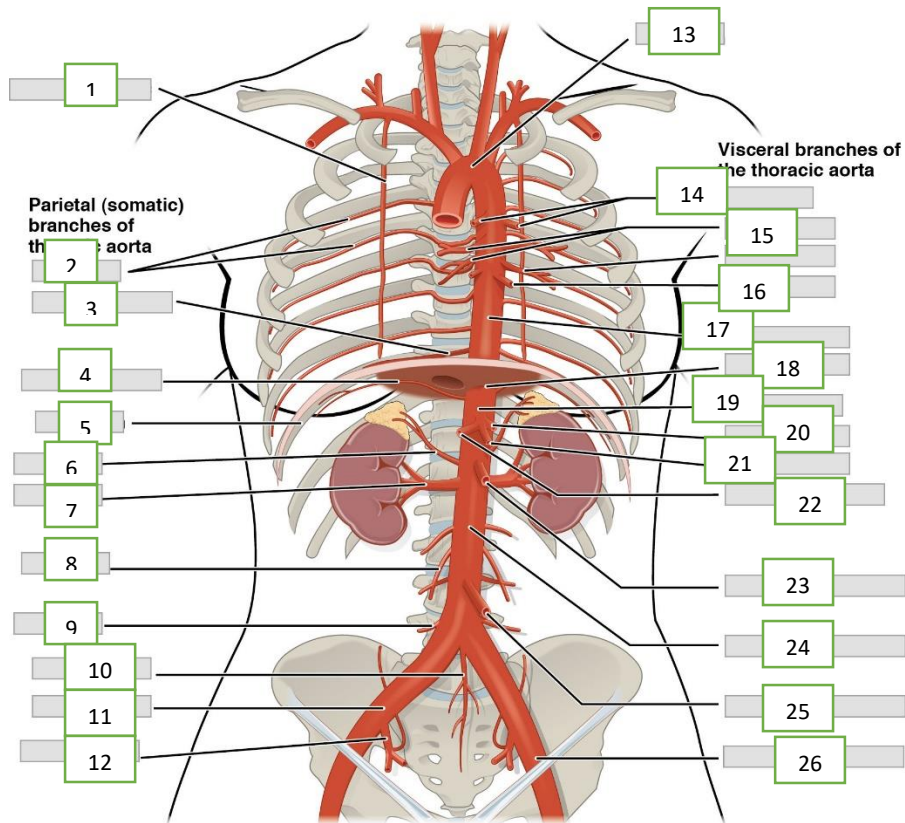
**Figure 7 Major arteries serving the brain including the circle of Willis**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_



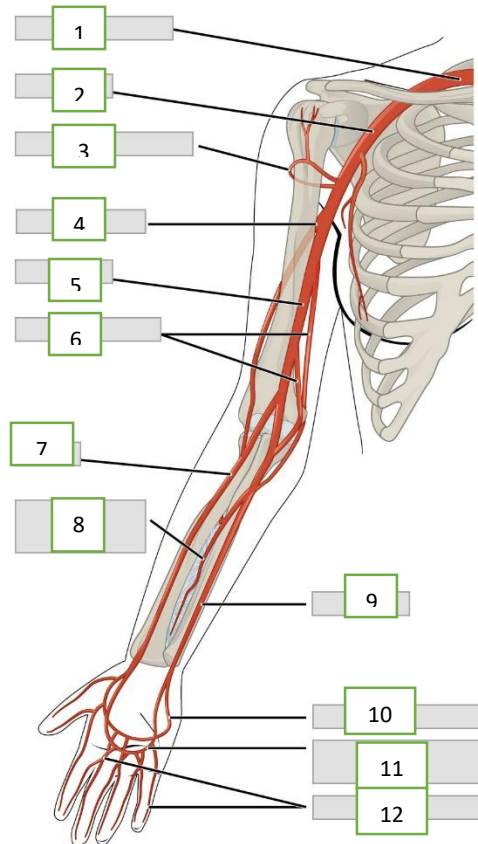
Label the arteries in figure 8.



**Figure 8 Major Arteries of the Thoracic and Abdominal Region**

- |           |           |
|-----------|-----------|
| 1. _____  | 14. _____ |
| 2. _____  | 15. _____ |
| 3. _____  | 16. _____ |
| 4. _____  | 17. _____ |
| 5. _____  | 18. _____ |
| 6. _____  | 19. _____ |
| 7. _____  | 20. _____ |
| 8. _____  | 21. _____ |
| 9. _____  | 22. _____ |
| 10. _____ | 23. _____ |
| 11. _____ | 24. _____ |
| 12. _____ | 25. _____ |
| 13. _____ | 26. _____ |

Label the arteries in figure 8.

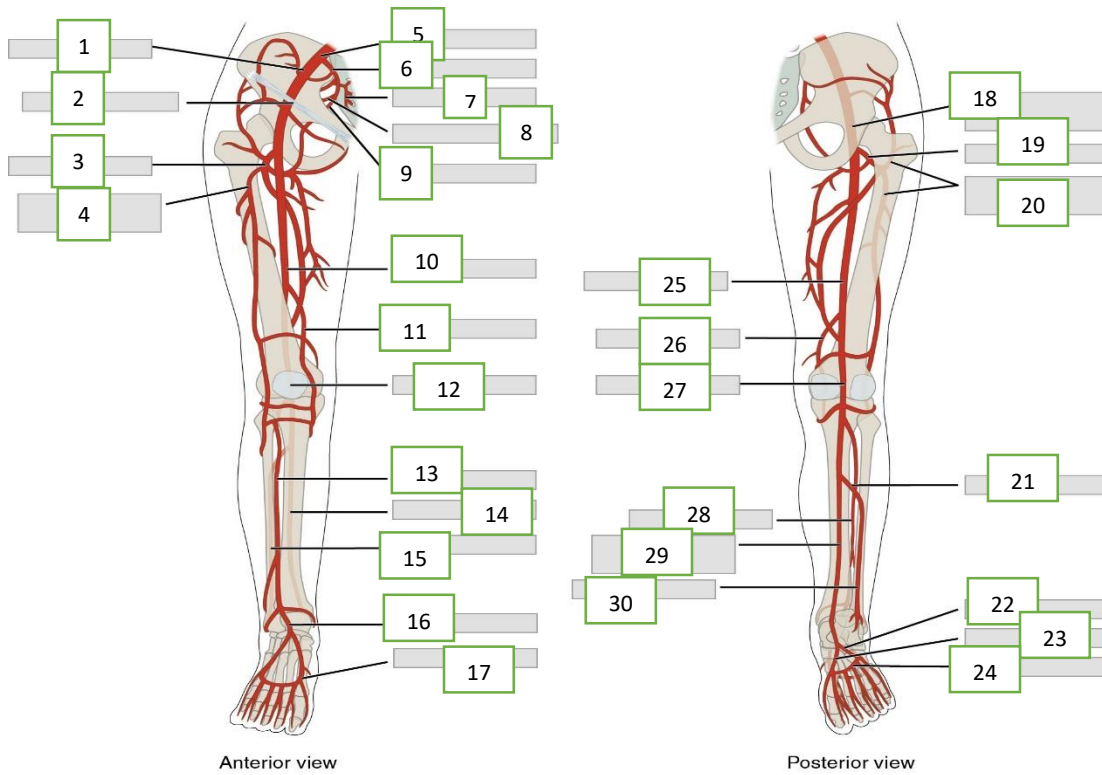


**Figure 9 Major Arteries Supplying the Thorax and Upper Limb**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_

Label the arteries in figure 9.

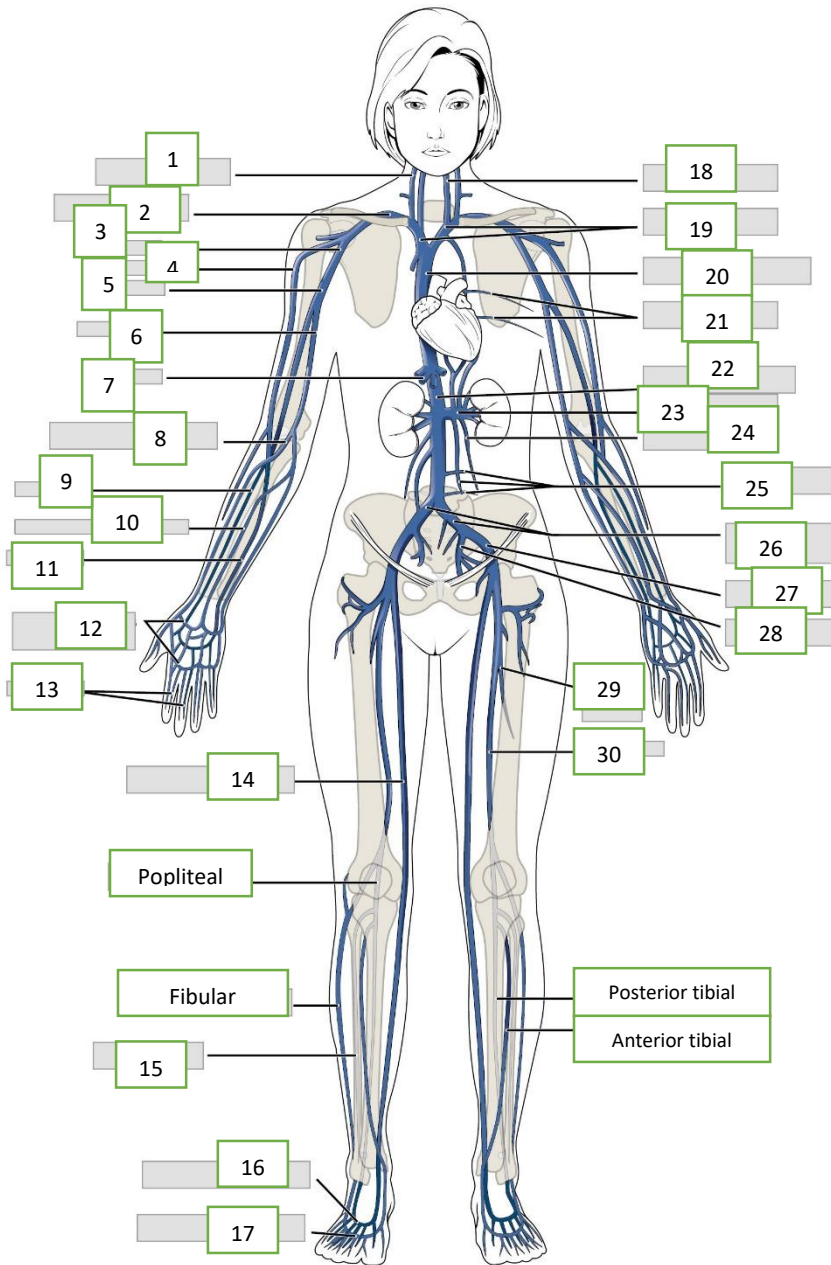


**Figure 10 Major Arteries of the pelvis and lower extremities**

- |           |           |
|-----------|-----------|
| 1. _____  | 16. _____ |
| 2. _____  | 17. _____ |
| 3. _____  | 18. _____ |
| 4. _____  | 19. _____ |
| 5. _____  | 20. _____ |
| 6. _____  | 21. _____ |
| 7. _____  | 22. _____ |
| 8. _____  | 23. _____ |
| 9. _____  | 24. _____ |
| 10. _____ | 25. _____ |
| 11. _____ | 26. _____ |
| 12. _____ | 27. _____ |
| 13. _____ | 28. _____ |
| 14. _____ | 29. _____ |
| 15. _____ | 30. _____ |

## Worksheet no. 5 Major Systemic Veins of the Body

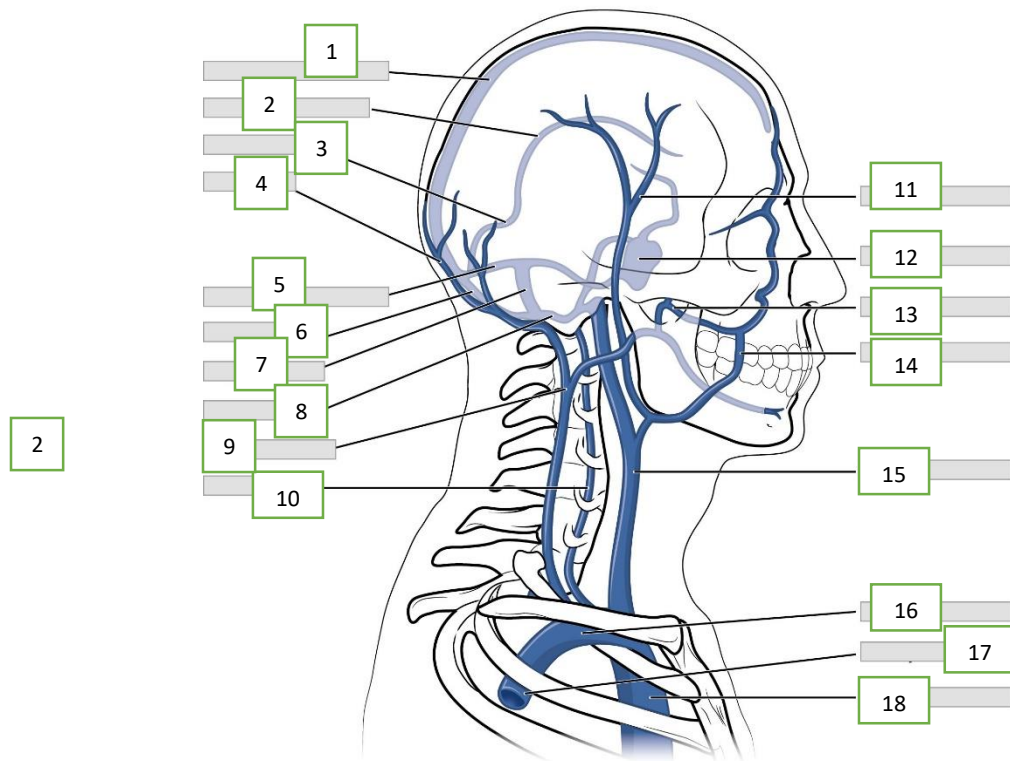
Label the major systematic arteries in figure 4. Write your answers on the space provided below



**Figure 11 Systemic Veins of the Body**

- |           |           |
|-----------|-----------|
| 1. _____  | 16 _____  |
| 2. _____  | 17. _____ |
| 3. _____  | 18 _____  |
| 4. _____  | 19. _____ |
| 5. _____  | 20. _____ |
| 6. _____  | 21. _____ |
| 7. _____  | 22. _____ |
| 8. _____  | 23. _____ |
| 9. _____  | 24. _____ |
| 10. _____ | 25. _____ |
| 11. _____ | 26. _____ |
| 12. _____ | 27. _____ |
| 13. _____ | 28. _____ |
| 14. _____ | 29. _____ |
| 15. _____ | 30. _____ |

Label the veins in Figure 12. Write your answers in the space provided below

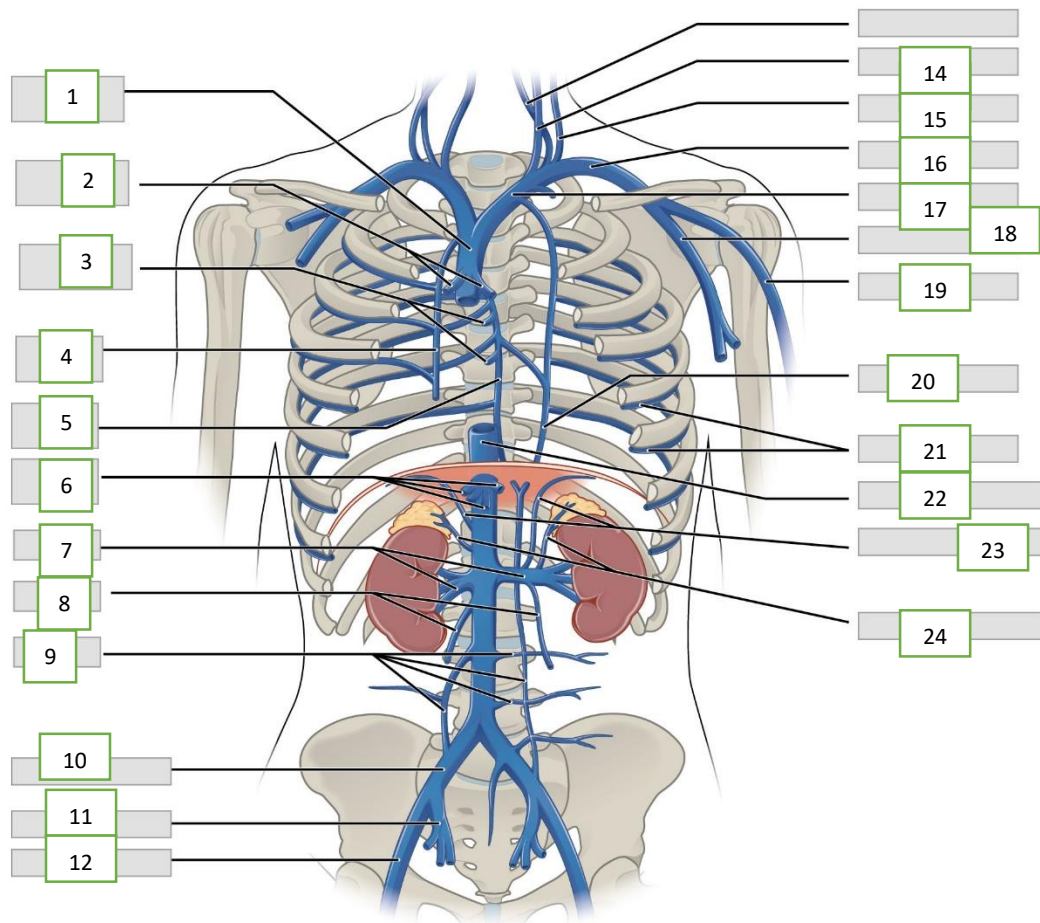


**Figure 12 Major Veins Draining the Head and Neck**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_

10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_
14. \_\_\_\_\_
15. \_\_\_\_\_
16. \_\_\_\_\_
17. \_\_\_\_\_
18. \_\_\_\_\_

Label the veins in Figure 13. Write your answers in the space provided below



**Figure 13 Major Veins Draining the Thorax, Abdomen, and Pelvis**

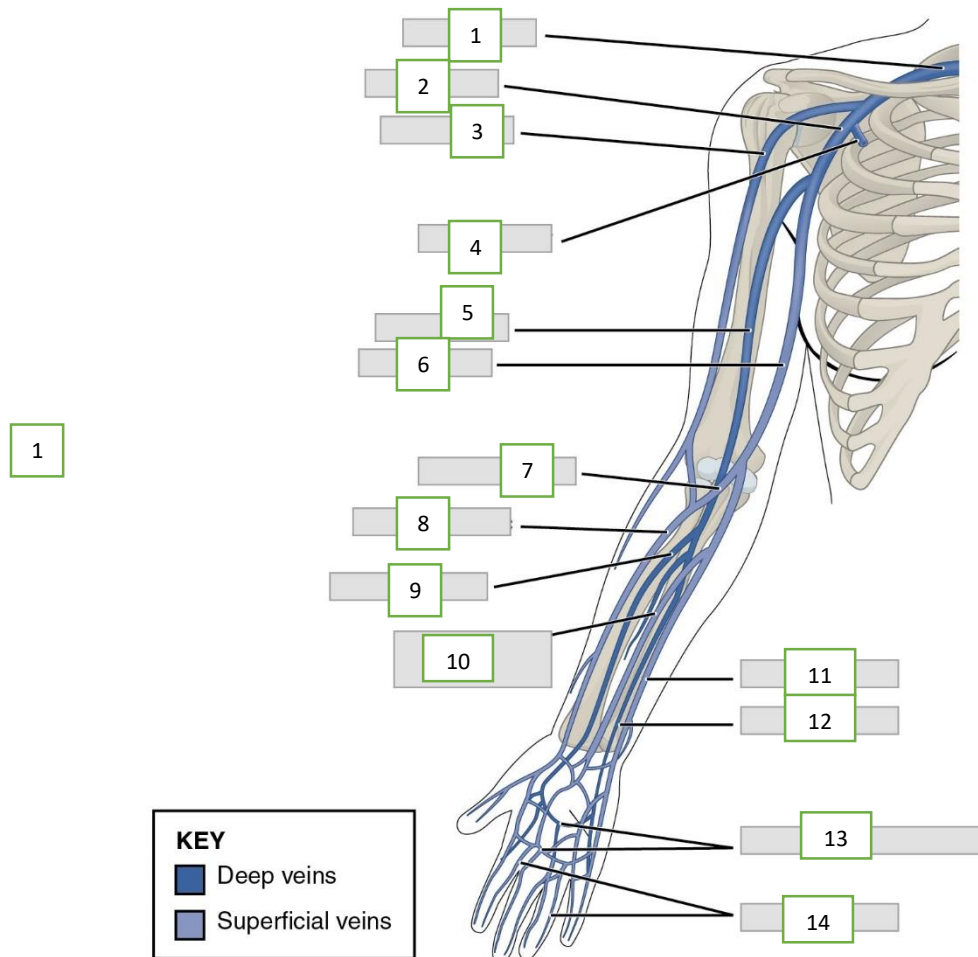
1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

13. \_\_\_\_\_
14. \_\_\_\_\_
15. \_\_\_\_\_
16. \_\_\_\_\_
17. \_\_\_\_\_

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7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_

18. \_\_\_\_\_
19. \_\_\_\_\_
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21. \_\_\_\_\_
22. \_\_\_\_\_
23. \_\_\_\_\_
24. \_\_\_\_\_

Label the veins in Figure 14. Write your answers in the space provided below

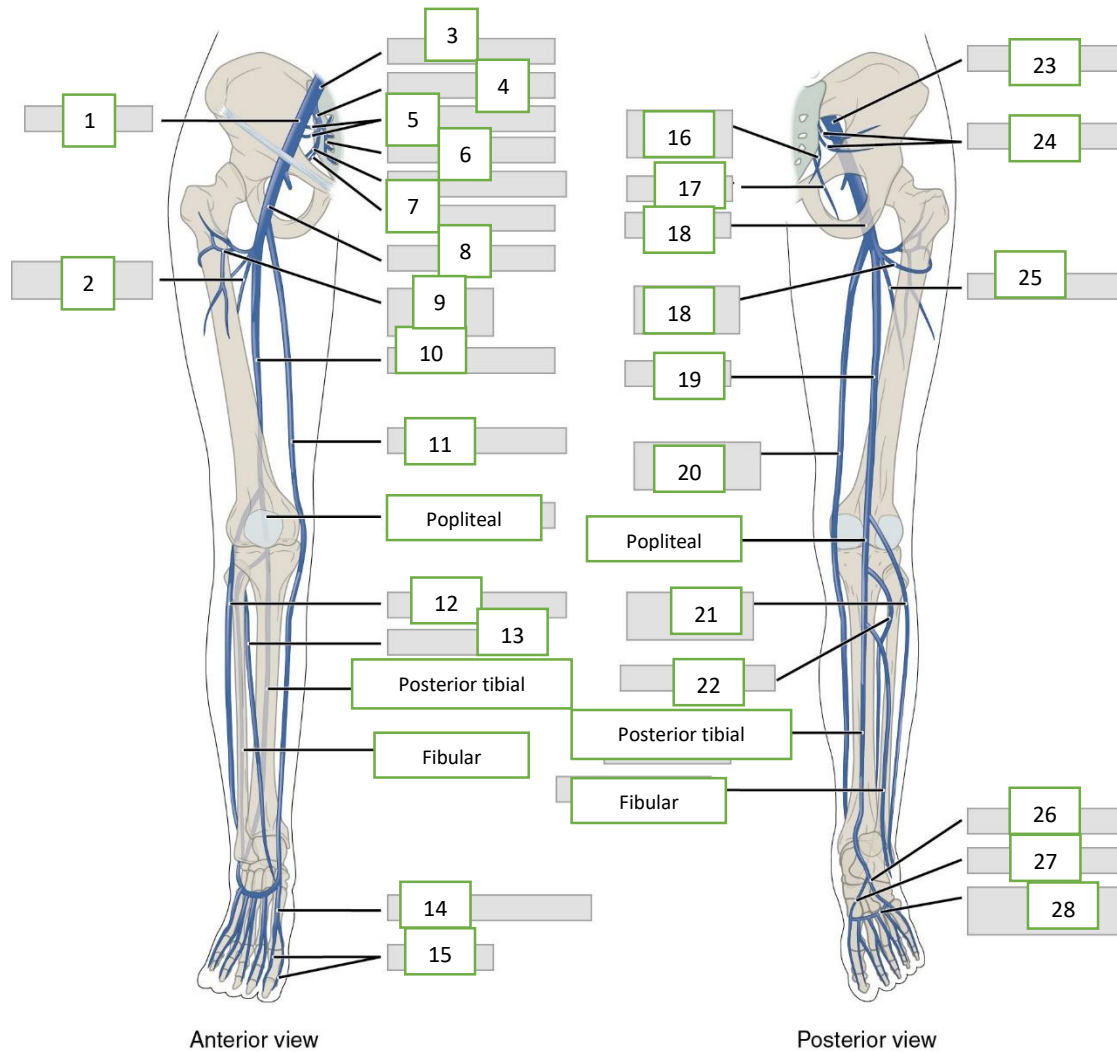


**Figure 14 Major Veins Draining the Upper Extremities**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_

8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_
14. \_\_\_\_\_

Labels the veins in Figure 15. Write your answers on the space provided below.



**Figure 15 Major Veins of the Lower Extremities**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_

15. \_\_\_\_\_
16. \_\_\_\_\_
17. \_\_\_\_\_
18. \_\_\_\_\_
19. \_\_\_\_\_
20. \_\_\_\_\_
21. \_\_\_\_\_
22. \_\_\_\_\_
23. \_\_\_\_\_
24. \_\_\_\_\_
25. \_\_\_\_\_

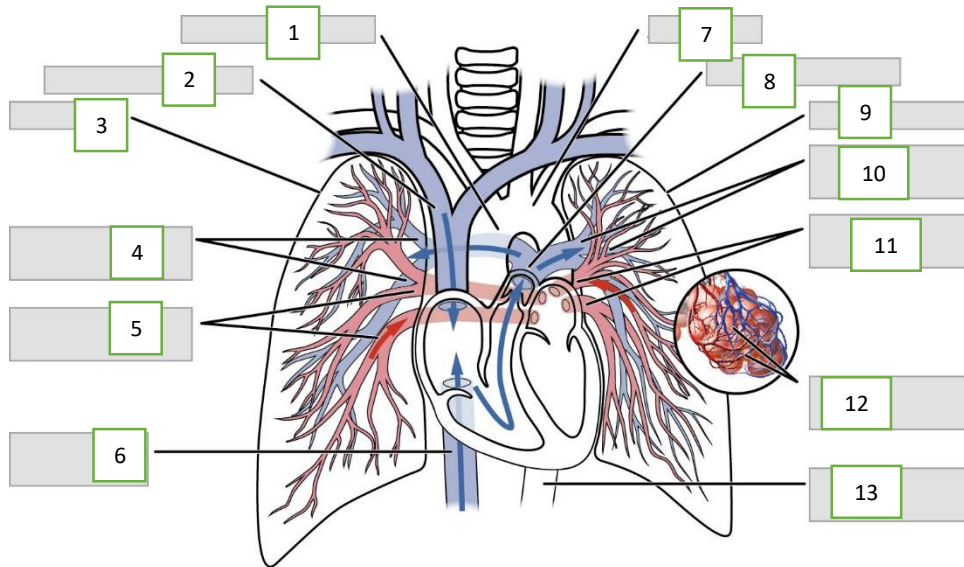


- 12. \_\_\_\_\_
- 13. \_\_\_\_\_
- 14. \_\_\_\_\_

- 26. \_\_\_\_\_
- 27. \_\_\_\_\_
- 28. \_\_\_\_\_

**Worksheet no.6 Pulmonary Circuit**

Label the arteries and veins in Figure 16.



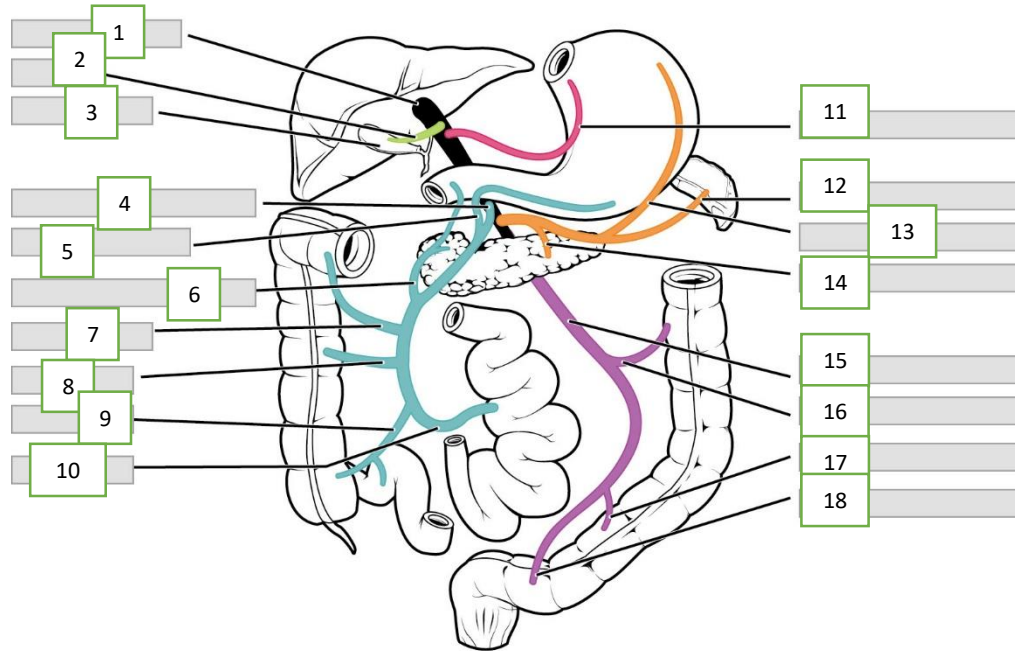
**Figure 16 Major Arteries and Veins of the Pulmonary Circuit**

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_
- 7. \_\_\_\_\_

- 8. \_\_\_\_\_
- 9. \_\_\_\_\_
- 10. \_\_\_\_\_
- 11. \_\_\_\_\_
- 12. \_\_\_\_\_
- 13. \_\_\_\_\_

Worksheet no.7 **Hepatic Portal System**

Label the veins in Figure 17.



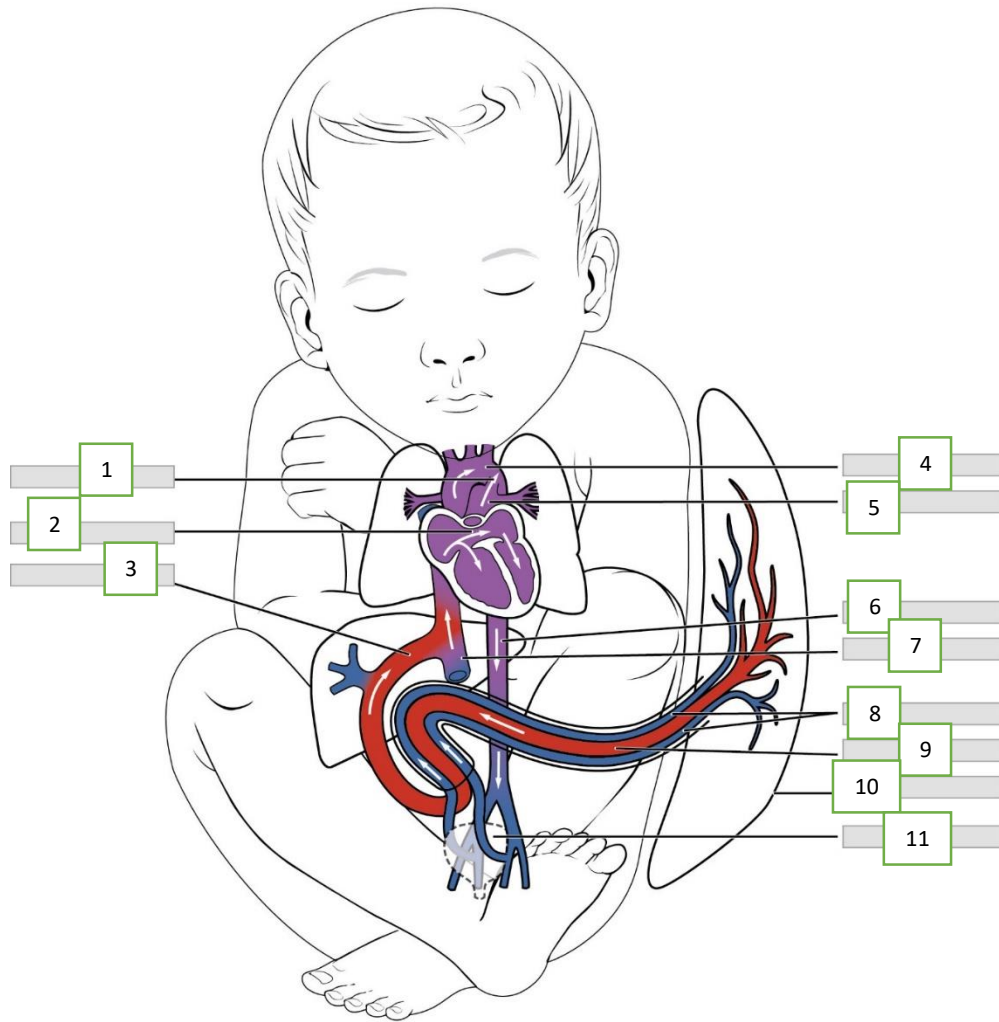
**Figure 16 Hepatic Portal System**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_

10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_
14. \_\_\_\_\_
15. \_\_\_\_\_
16. \_\_\_\_\_
17. \_\_\_\_\_
18. \_\_\_\_\_

Worksheet no.8 **Fetal Circulation**

Label the fetal structure in Figure 18.



**Figure 18 Fetal Circulation**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_

YOU MAY NOW PROCEED TO THE NEXT LABORATORY ACTIVITY



## **References**

### **Adapted Images**

Figure 1 to Figure 18 OpenStax (2017) Anatomy and Physiology