

Laboratory Exercise

13

Organization of the Skeleton

Materials Needed

Textbook
Articulated human skeleton

For Learning Extension:

Colored pencils

For Demonstration:

Radiographs (X rays) of skeletal structures

The skeleton can be divided into two major portions: (1) the axial skeleton, which consists of the bones and cartilages of the head, neck, and trunk, and (2) the appendicular skeleton, which consists of the bones of the limbs and those that anchor the limbs to the axial skeleton. The bones that anchor the limbs include the pectoral and pelvic girdles.

Purpose of the Exercise

To review the organization of the skeleton, the major bones of the skeleton, and the terms used to describe skeletal structures.

LEARNING OUTCOMES

After completing this exercise, you should be able to

- 1 Distinguish between the axial skeleton and the appendicular skeleton.
- 2 Locate and label the major bones of the human skeleton.
- 3 Associate the terms used to describe skeletal structures and locate examples of such structures on the human skeleton.

EXPLORE

Procedure—Organization of the Skeleton

1. Review the section entitled "Skeletal Organization" in chapter 7 of the textbook. (Pronunciations of the names for major skeletal structures are included within the narrative of chapter 7.)
2. As a review activity, label figure 13.1.

3. Examine the human skeleton and locate the following parts. As you locate the following bones, note the number of each in the skeleton. Palpate as many of the corresponding bones in your skeleton as possible.

axial skeleton

skull	
cranium	(8)
face	(14)
middle ear bone	(6)
hyoid bone	(1)
vertebral column	
vertebra	(24)
sacrum	(1)
coccyx	(1)
thoracic cage	
rib	(24)
sternum	(1)

appendicular skeleton

pectoral (shoulder) girdle	
scapula	(2)
clavicle	(2)
upper limbs	
humerus	(2)
radius	(2)
ulna	(2)
carpal	(16)
metacarpal	(10)
phalanx	(28)
pelvic girdle	
hip bone (coxal bone; pelvic bone; innominate)	(2)
lower limbs	
femur	(2)
tibia	(2)
fibula	(2)
patella	(2)
tarsal	(14)
metatarsal	(10)
phalanx	(28)

Total	206 bones
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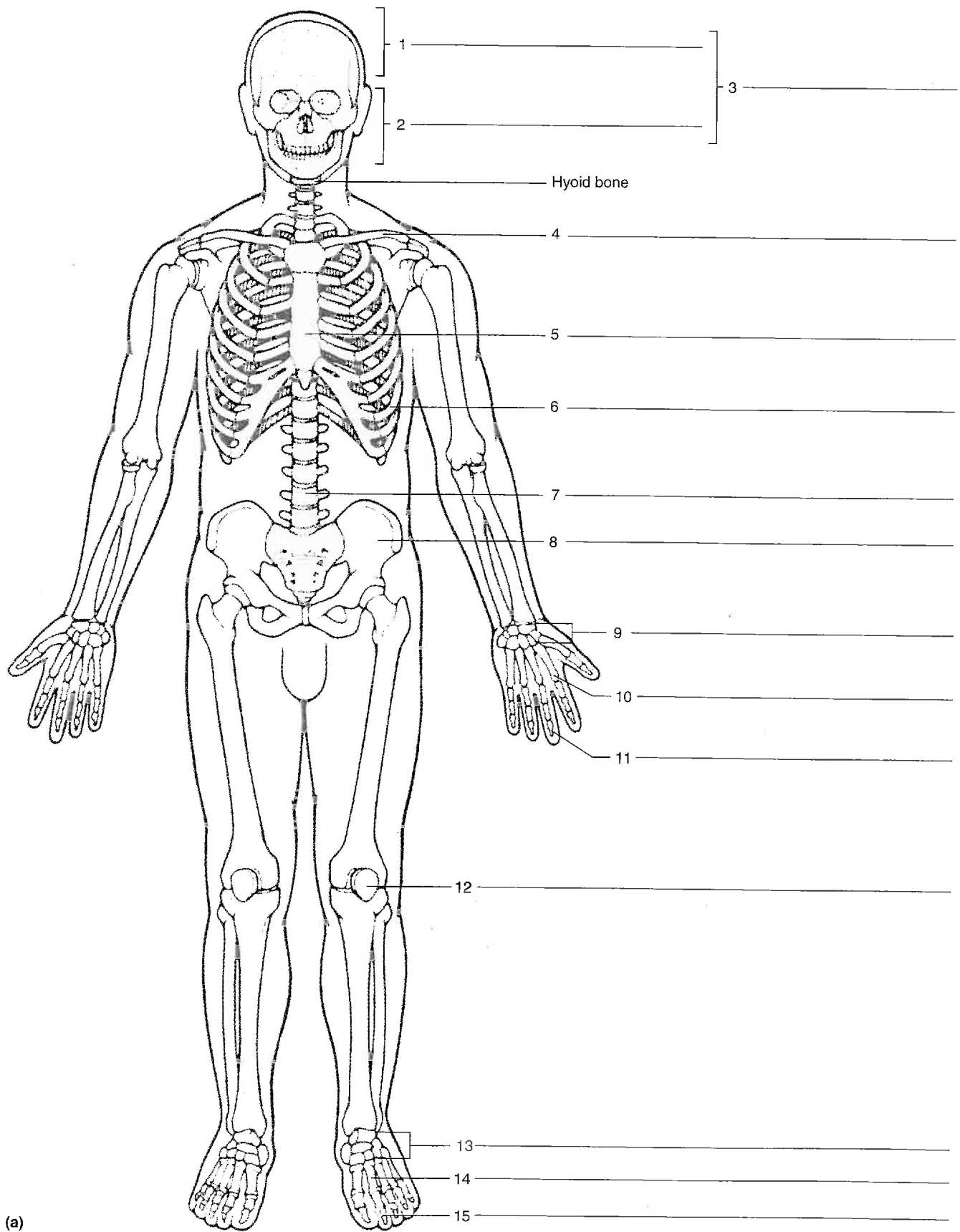
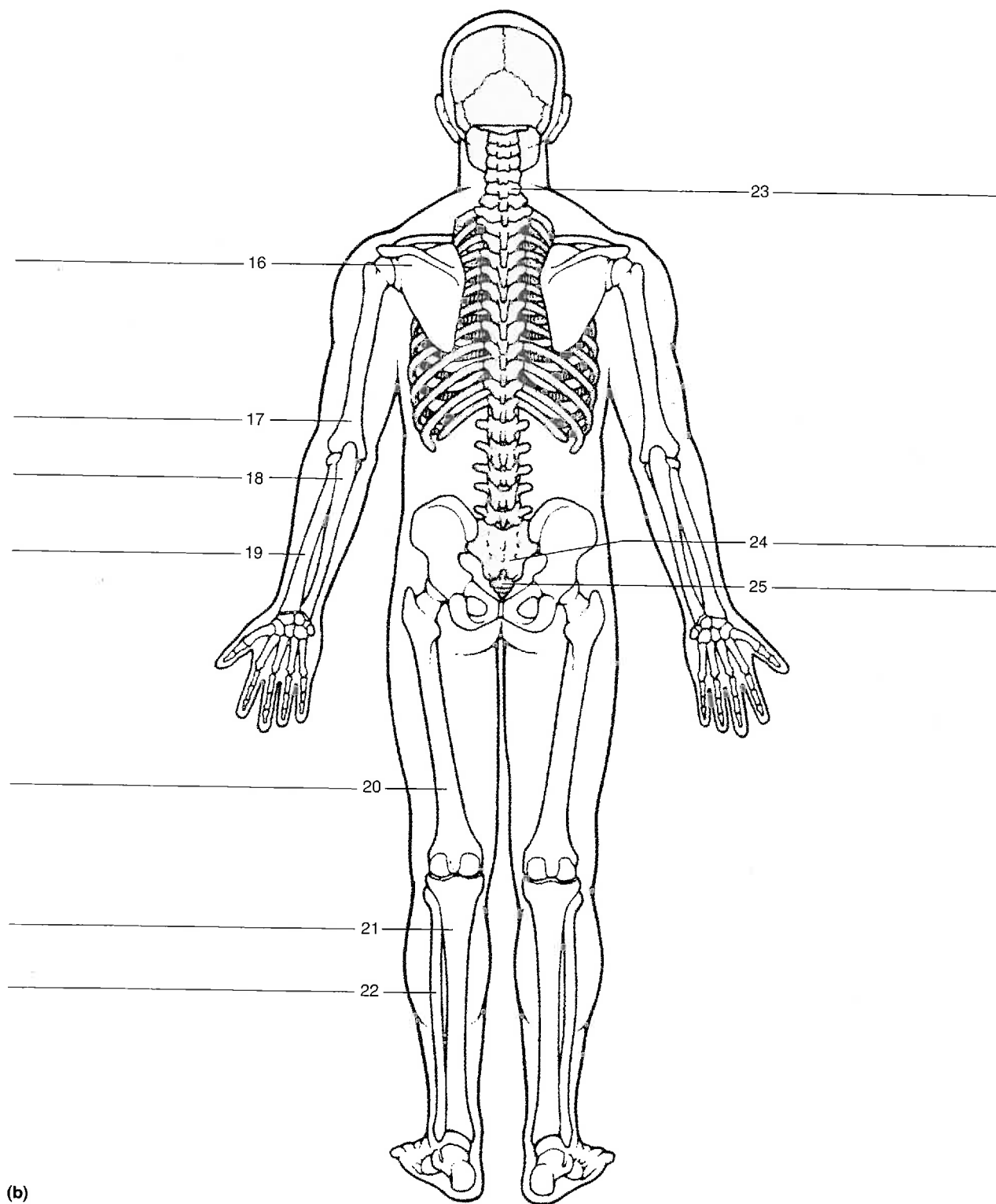


Figure 13.1 Label the major bones of the skeleton: (a) anterior view; (b) posterior view. **1 2**



(b)

Figure 13.1 Continued.



Learning Extension

Use colored pencils to distinguish the individual bones in figure 13.1.

4. Study table 7.4 in chapter 7 of the textbook. Bone features (bone markings) can be grouped together in a category of projections, articulations, depressions, or openings. Within each category more specific examples occur. The bones listed in this section only represent an example of a location in the human body. Locate an example of each of the following features on the example bone listed, noting the size, shape, and location in the human skeleton:

Projections:

crest (ridgelike)—hip bone
epicondyle (superior to condyle)—femur
line (linea) (slightly raised ridge)—femur
process (prominent)—vertebra
protuberance (outgrowth)—skull (occipital)
ramus (extension)—hip bone
spine (thornlike)—scapula
trochanter (large)—femur
tubercle (knoblike)—humerus
tuberosity (rough elevation)—tibia

Articulations:

condyle (rounded process)—skull (occipital)
facet (nearly flat)—vertebra
head (expanded end)—femur

Depressions:

fossa (shallow basin)—humerus
fovea (tiny pit)—femur

Openings:

canal (tubular passage)—skull (occipital)
fissure (slit)—skull (orbit)

foramen (hole)—vertebra
meatus (tubelike)—skull (temporal)
sinus (cavity)—skull (maxilla)



Critical Thinking Application

Locate and name the largest foramen in the skull.

Locate and name the largest foramen in the skeleton.

5. Complete Parts A, B, C, and D of Laboratory Report 13.

Demonstration

Images on radiographs (X rays) are produced by allowing X rays from an X-ray tube to pass through a body part and to expose photographic film positioned on the opposite side of the part. The image that appears on the film after it is developed reveals the presence of parts with different densities. Bone, for example, is very dense tissue and is a good absorber of X rays. Thus, bone generally appears light on the film. Air-filled spaces, on the other hand, absorb almost no X rays and appear as dark areas on the film. Liquids and soft tissues absorb intermediate quantities of X rays, so they usually appear in various shades of gray.

Examine the available radiographs of skeletal structures by holding each film in front of a light source. Identify as many of the bones and features as you can.