NAME _____

LAB TIME/DATE _____

REVIEW SHEET EXERCISE 19

Gross Anatomy of the Brain and Cranial Nerves

The Human Brain

1. Match the letters on the diagram of the human brain (right lateral view) to the appropriate terms listed at the left.

_____ 1. frontal lobe

_____ 2. parietal lobe

_____ 3. temporal lobe

_____ 4. precentral gyrus

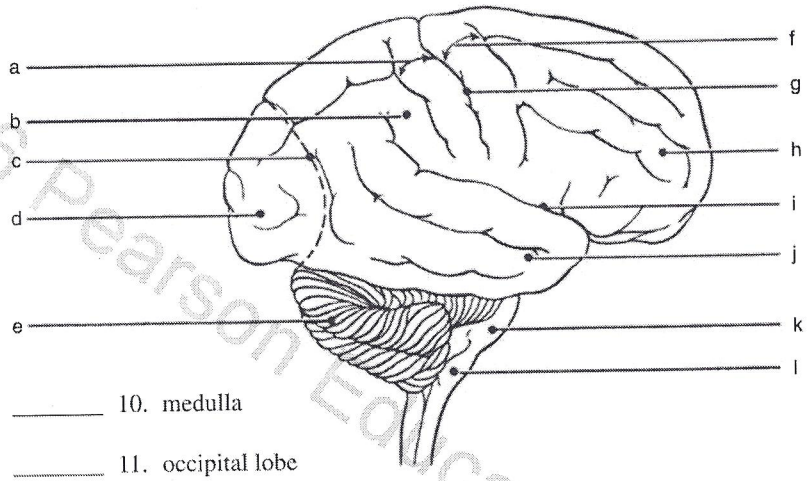
_____ 5. parieto-occipital sulcus

_____ 6. postcentral gyrus

_____ 7. lateral sulcus

_____ 8. central sulcus

_____ 9. cerebellum



_____ 10. medulla

_____ 11. occipital lobe

_____ 12. pons

2. In which of the cerebral lobes are the following functional areas found?

auditory cortex: _____

primary motor cortex: _____

primary sensory cortex: _____

olfactory cortex: _____

visual cortex: _____

Broca's area: _____

3. Which of the following structures are not part of the brain stem? (Circle the appropriate response or responses.)

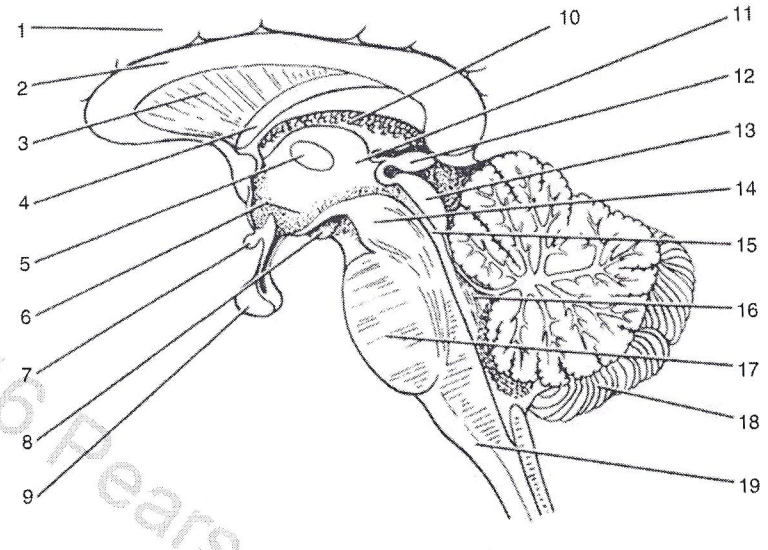
cerebral hemispheres pons midbrain cerebellum medulla diencephalon

4. Complete the following statements by writing the proper word or phrase on the corresponding blanks at the right.

A(n) _1_ is an elevated ridge of cerebral tissue. The convolutions seen in the cerebrum are important because they increase the _2_. Gray matter is composed of _3_. White matter is composed of _4_. A fiber tract that provides for communication between different parts of the same cerebral hemisphere is called a(n) _5_, whereas one that carries impulses from the cerebrum to lower CNS areas is called a(n) _6_ tract. The lentiform nucleus along with the caudate nuclei are collectively called the _7_.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

5. Identify the structures on the following sagittal view of the human brain stem and diencephalon by matching the numbered areas to the proper terms in the list.



_____ a. cerebellum

_____ b. cerebral aqueduct

_____ c. (small part of) cerebral hemisphere

_____ d. cerebral peduncle

_____ e. choroid plexus

_____ f. corpora quadrigemina

_____ g. corpus callosum

_____ h. fornix

_____ i. fourth ventricle

_____ j. hypothalamus

_____ k. intermediate mass

_____ l. mammillary bodies

_____ m. medulla oblongata

_____ n. optic chiasma

_____ o. pineal gland

_____ p. pituitary gland

_____ q. pons

_____ r. septum pellucidum

_____ s. thalamus

6. Using the terms from question 5, match the appropriate structures with the descriptions given below.

_____ 1. site of regulation of body temperature and water balance; most important autonomic center

_____ 2. consciousness depends on the function of this part of the brain

_____ 3. located in the midbrain; contains reflex centers for vision and audition

_____ 4. responsible for regulation of posture and coordination of complex muscular movements

_____ 5. important synapse site for afferent fibers traveling to the sensory cortex

_____ 6. contains autonomic centers regulating blood pressure, heart rate, and respiratory rhythm, as well as coughing, sneezing, and swallowing centers

_____ 7. large commissure connecting the cerebral hemispheres

_____ 8. fiber tract involved with olfaction

_____ 9. connects the third and fourth ventricles

_____ 10. encloses the third ventricle

7. Embryologically, the brain arises from the rostral end of a tubelike structure that quickly becomes divided into three major regions. Groups of structures that develop from the embryonic brain are listed below. Designate the embryonic origin of each group as the hindbrain, midbrain, or forebrain.

_____ 1. the diencephalon, including the thalamus, optic chiasma, and hypothalamus

_____ 2. the medulla, pons, and cerebellum

_____ 3. the cerebral hemispheres

8. What is the function of the basal ganglia? _____

_____

9. What is the corpus striatum, and how is it related to the fibers of the internal capsule? _____

_____

_____

10. A brain hemorrhage within the region of the right internal capsule results in paralysis of the left side of the body.

Explain why the left side (rather than the right side) is affected. _____

_____

11. Explain why trauma to the base of the brain is often much more dangerous than trauma to the frontal lobes. (Hint: Think about the relative functioning of the cerebral hemispheres and the brain stem structures. Which contain centers more vital to life?)

_____

_____

_____

12. In "split brain" experiments, the main commissure connecting the cerebral hemispheres is cut. First, name this commissure.

_____

Then, describe what results (in terms of behavior) can be anticipated in such experiments. (Use an appropriate reference if you need help with this one!)

_____

_____

_____

_____

_____

Meninges of the Brain

13. Identify the meningeal (or associated) structures described below:

_____ 1. outermost meninx covering the brain; composed of tough fibrous connective tissue

_____ 2. innermost meninx covering the brain; delicate and highly vascular

_____ 3. structures instrumental in returning cerebrospinal fluid to the venous blood in the dural sinuses

_____ 4. structure that forms the cerebrospinal fluid

_____ 5. middle meninx; like a cobweb in structure

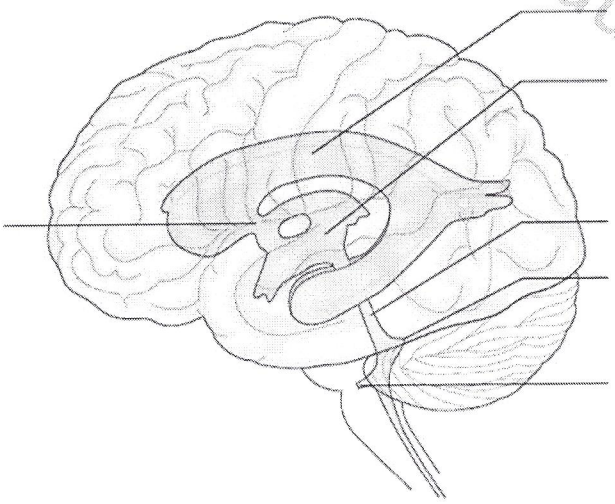
_____ 6. its outer layer forms the periosteum of the skull

_____ 7. a dural fold that attaches the cerebrum to the crista galli of the skull

_____ 8. a dural fold separating the cerebrum from the cerebellum

Cerebrospinal Fluid

14. Label the structures involved with circulation of cerebrospinal fluid on the accompanying diagram.



Add arrows to the figure above to indicate the flow of cerebrospinal fluid from its formation in the lateral ventricles to the site of its exit from the fourth ventricle. Then fill in the blanks in the following paragraph.

Cerebrospinal fluid flows from the fourth ventricle into the central canal of the spinal cord and the _1_ space surrounding the brain and spinal cord. From this space it drains through the _2_ into the _3_.

1. _____

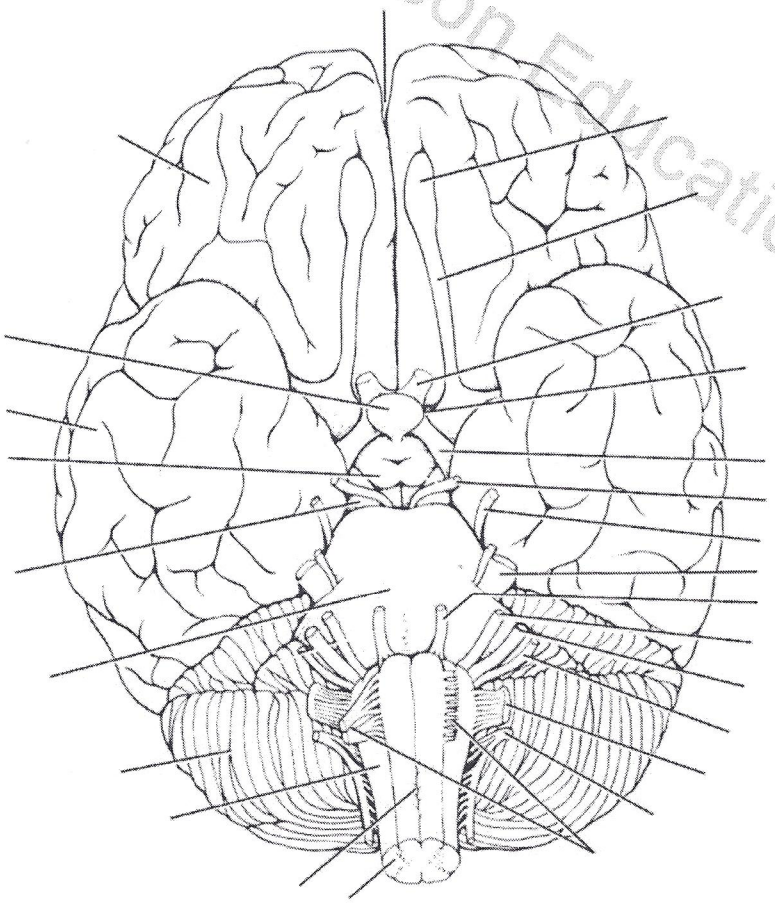
2. _____

3. _____

Cranial Nerves

15. Using the terms below, correctly identify all structures indicated by leader lines on the diagram.

a. abducens nerve (VI)
b. accessory nerve (XI)
c. cerebellum
d. cerebral peduncle
e. decussation of the pyramids
f. facial nerve (VII)
g. frontal lobe of cerebral hemisphere
h. glossopharyngeal nerve (IX)
i. hypoglossal nerve (XII)
j. longitudinal fissure
k. mammillary body
l. medulla oblongata
m. oculomotor nerve (III)
n. olfactory bulb
o. olfactory tract
p. optic chiasma
q. optic nerve (II)
r. optic tract
s. pituitary gland
t. pons
u. spinal cord
v. temporal lobe of cerebral hemisphere
w. trigeminal nerve (V)
x. trochlear nerve (IV)
y. vagus nerve (X)
z. vestibulocochlear nerve (VIII)



16. Provide the name and number of the cranial nerves involved in each of the following activities, sensations, or disorders.

_____ 1. rotating the head

_____ 2. smelling a flower

_____ 3. raising the eyelids; pupillary constriction

_____ 4. slowing the heart; increasing motility of the digestive tract

_____ 5. involved in Bell's palsy (facial paralysis)

_____ 6. chewing food

_____ 7. listening to music; seasickness

_____ 8. secretion of saliva; tasting well-seasoned food

_____ 9. involved in "rolling" the eyes (three nerves—provide numbers only)

_____ 10. feeling a toothache

_____ 11. reading the newspaper

_____ 12. purely sensory in function (three nerves—provide numbers only)

Dissection of the Sheep Brain

17. In your own words, describe the firmness and texture of the sheep brain tissue as observed when cutting into it.

_____

Because formalin hardens all tissue, what conclusions might you draw about the firmness and texture of living brain tissue?

_____

18. When comparing human and sheep brains, you observe some profound differences between them. Record your observations in the chart below.

Structure	Human	Sheep
Olfactory bulb		
Pons/medulla relationship		
Location of cranial nerve III		
Mammillary body		
Corpus callosum		
Intermediate mass of thalamus		
Relative size of superior and inferior colliculi		
Pineal gland		