

Name _____

Team # _____

**ohwell's Anatomy and Physiology
Test**

SSSS 2019

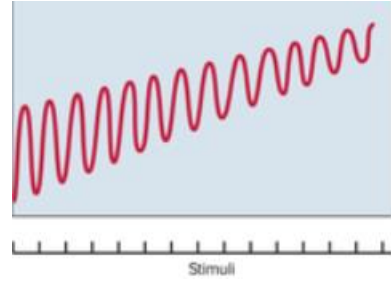
1. Acetylcholine receptors on the sarcolemma of muscle cells are _____
 - a. G-Proteins
 - b. Voltage-Independent Ion Channels
 - c. Voltage-Dependent Ion Channels
 - d. Ligand-Regulated Ion Channels
2. Select all that are functions of keratinocytes:
 - a. Production of more keratinocytes via mitosis
 - b. Synthesis of melanin
 - c. Secretion of sweat
 - d. Synthesis of Vitamin D
3. There are two ways skeletal muscles can be attached to bone. In direct attachment the muscle is _____ attached to bone while in indirect attachment the muscle is _____ attached to bone.
 - a. directly; attached to collagen fibers that are
 - b. attached to collagen fibers that are; directly
 - c. attached to collagen fibers that are; attached to collagen fibers that are
 - d. directly; directly
4. In muscle, thin filaments are made of mostly _____ and thick filaments are made of mostly _____.
 - a. Actin; Troponin
 - b. Actin; Myosin
 - c. Myosin; Titin
 - d. Troponin; Tropomyosin
5. Which is the most common muscle fiber type in people who do not exercise frequently?
 - a. Type I
 - b. Type IIa
 - c. Type IIx
 - d. Type III
6. The muscle fiber type described in question 5 is _____.
 - a. Fast twitch and oxidative
 - b. Slow twitch and oxidative
 - c. Fast twitch and glycolytic
 - d. Slow twitch and glycolytic
7. What is the approximate ratio of inorganic to organic matter in your bones?
 - a. 1:1
 - b. 2:1
 - c. 3:1
 - d. 4:1

8. Your friend, Anna loves consuming cola. In fact, she drinks an entire 2 liter bottle every day(!) What bone related disease is Anna at risk of developing?
 - a. Achondroplastic dwarfism
 - b. Rickets
 - c. Osteosarcoma
 - d. Osteoporosis
9. Bonus! What ingredient in cola is thought to cause the increase Anna's risk of developing the disease described in question 8?
 - a. Phosphoric Acid
 - b. Benzoic Acid
 - c. Carbonic Acid
 - d. High Fructose Corn Syrup
10. Bone is deposited by cells called _____, which turn into _____ as they mature.
 - a. Osteoblasts, Osteoclasts
 - b. Osteocytes, Osteoclasts
 - c. Osteoclasts, Osteoblasts
 - d. Osteoblasts, Osteocytes
11. Which hormone increases osteoblast activity and inhibits osteoclast activity in children but has only a weak affect in adults?
 - a. Vitamin D₃
 - b. Calcitonin
 - c. Parathyroid Hormone
 - d. Calcitriol
12. Cranial sutures are what type of joint?
 - a. Synostosis
 - b. Synarthrosis
 - c. Amphiarthrosis
 - d. Diarthrosis
13. Articular cartilage in between synovial joints is composed of what kind of cartilage?
 - a. Elastic Cartilage
 - b. Hyaline Cartilage
 - c. Fibrocartilage
 - d. None of the above
14. Which type of synovial joint allows for the supination and pronation of your radius and ulna?
 - a. Pivot joint
 - b. Ball-and-socket joint
 - c. Hinge joint
 - d. Saddle joint

15. In smooth muscle, the thin filaments are anchored to _____
- Dense bodies
 - Z-discs
 - the Sarcolemma
 - M-lines
16. Keratinocytes are connected to each other via (select all that apply)
- Desmosomes
 - Gap Junctions
 - Tight Junctions
 - Hemidesmosomes
17. Bones develop from what embryonic tissue?
- Parenchyme
 - Collenchyme
 - Mesenchyme
 - Sclerenchyme
18. Which of the following statements concerning bone growth is true?
- Long bones grow via endochondral ossification only; flat bones grow via intramembranous ossification only.
 - Long bones grow via endochondral and intramembranous ossification; flat bones via intramembranous ossification only.
 - Long bones grow via intramembranous ossification only; flat bones grow via endochondral ossification only.
 - Both long and flat bones grow via intramembranous and endochondral ossification.
19. In a bicep curl, which muscle provides the most force?
- Triceps Brachii
 - Brachialis
 - Biceps Brachii
 - Brachioradialis
20. Where are calcium ions stored in skeletal muscle?
- Inside T-tubules
 - In the sarcoplasm
 - Bound to troponin
 - In the sarcoplasmic reticulum
21. Which of the following may contain multiple nuclei? (Select all that apply)
- Osteocytes
 - Osteoblasts
 - Osteoclasts
 - Skeletal muscle fibers
 - Smooth muscle cells

22. What does this pattern of muscle twitches demonstrate?

- a. Incomplete tetanus
- b. Complete tetanus
- c. Normal muscle twitches
- d. None of the above



23. What is the “shape” of the biceps brachii?

- a. Unipennate
- b. Parallel
- c. Bipennate
- d. Fusiform

24. Fast twitch fibers are usually organized into _____ motor units while slow twitch fibers are usually organized into _____ motor units.

- a. larger and more sensitive, smaller and less sensitive
- b. smaller and less sensitive, larger and more sensitive
- c. larger and less sensitive, smaller and more sensitive
- d. smaller and more sensitive, larger and less sensitive

25. Skin is classified as thick skin or thin skin based on the thickness of the _____

- a. Hypodermis
- b. Reticular layer of the dermis
- c. Papillary layer of the dermis
- d. Stratum Spinosum
- e. Stratum Corneum

26. How long does a typical keratinocyte live before it flakes off?

- a. 10-20 days
- b. 20-30 days
- c. 30-40 days
- d. 40-50 days

27. What birthmark is characterized by its large, pink-purplish appearance and is generally retained for life? Hint: Mikhail Gorbachev has this on his forehead

- a. Capillary hemangioma
- b. Cavernous hemangioma
- c. Port-wine stain
- d. None of the above

28. In which phase does the hair detach from the matrix and form club hair?

- a. Early Anagen
- b. Mature Anagen
- c. Catagen
- d. Telogen

29. Osteons are found in _____ bone and are _____ in a cross section.
- compact, circular
 - spongy, circular
 - compact, rectangular
 - spongy, rectangular
30. What is the name of the fibrous sheath that covers a fascicle in skeletal muscle?
- Endomysium
 - Perimysium
 - Epimysium
 - None of the above
31. Bonus! The designation “Z-disc” comes from what German word meaning “between disk”
- Zwitterscheibe
 - Zweischeibe
 - Zauberinscheibe
 - Zwischenscheibe
32. ATP levels in fatigued muscle are _____ than ATP levels in resting muscle
- Less than
 - Greater than
 - Approximately equal to
33. Which of the following is a cause of muscle fatigue in short term high intensity exercise?
- ADP/P_i accumulation
 - Loss of electrolytes via sweat
 - Depletion of muscle glycogen
 - Ammonia production by muscles
34. Lay your forearm on the table with your palm down, keeping your forearm flat on the table, rapidly rotate it so your palm faces upward. What movement is demonstrated?
- Pronation
 - Supination
 - Abduction
 - Flexion
35. Select the muscle(s) that participate in the movement in question 34
- Biceps brachii
 - Pronator teres
 - Supinator
 - Triceps brachii

36. Jack likes to play on the playground with his friends. One day, he falls and fractures his forearm bones. His doctor places his arm in a cast. What will happen to the muscles in the cast?
- They will become stronger, since they have time to grow and repair
 - They will become weaker as a result of disuse atrophy
 - They will remain the same strength, since they are not being used
 - They will not be able to grow due to the stiffness of the cast
37. The inorganic matter in bone contains which ion(s)?
- Ca^{2+}
 - Mg^{2+}
 - CO_3^{2-}
 - PO_4^{3-}
 - OH^-
38. Yellow bone marrow cannot revert back to red bone marrow
- True
 - False
39. Most ribs are attached to the sternum via _____
- Bone
 - Hyaline Cartilage
 - Elastic Cartilage
 - Fibrocartilage
40. Which injury to skeletal muscle is characterized by hyperkalemia, myoglobinuria and heart irregularities?
- Contracture
 - Cramps
 - Fibromyalgia
 - Crush syndrome
41. Hair consists of _____
- α -keratin with many disulfide bonds
 - α -keratin with fewer disulfide bonds
 - β -keratin with fewer disulfide bonds
 - β -keratin with many disulfide bonds
42. Nails consist of _____
- α -keratin with many disulfide bonds
 - α -keratin with fewer disulfide bonds
 - β -keratin with fewer disulfide bonds
 - β -keratin with many disulfide bonds

43. People with darker skin have _____ melanocytes than people with lighter skin
- More
 - Less
 - The same amount of
44. Tactile cells are found in the _____ and are associated with a nerve fiber in the _____.
- Stratum Basale, Stratum Basale
 - Stratum Basale, Dermis
 - Stratum Spinosum, Stratum Spinosum
 - Stratum Spinosum, Stratum Basale
45. The tendon of which muscle is often used for grafting and can be removed usually without many adverse effects?
- Tibialis anterior
 - Gastrocnemius
 - Plantaris
 - Fibularis longus
46. In a healthy human adult, where would red bone marrow likely be found?
- Shaft of the humerus
 - Shaft of the femur
 - Ribs
 - Tibia
47. In a mature long bone, the head is known as the _____ and the shaft is known as the _____. They are separated by the _____.
- Epiphysis, Diaphysis, Epiphyseal line
 - Diaphysis, Epiphysis, Periosteum
 - Epiphysis, Diaphysis, Endosteum
 - Diaphysis, Epiphysis, Diaphyseal line
 - Diaphysis, Epiphysis, Bone Marrow
48. Osteons are centered around a _____ canal, which intersect with diagonal _____ canals.
- Volkmann, Canalicular
 - Volkmann, Lacunar+
 - Lacunar, Canalicular
 - Haversian, Volkmann

49. When you lift a heavy object, isotonic contraction occurs _____ isometric contraction. In isotonic contraction, the muscle changes _____ without a change in _____.
- Before, length, tension
 - After, length, tension
 - Before, tension, length
 - After, tension, length
50. As a muscle fiber becomes fatigued, ___ ions accumulate outside the cell, _____ it.
- K^+ , depolarizing
 - K^+ , hyperpolarizing
 - Ca^{2+} , hyperpolarizing
 - Ca^{2+} , depolarizing

-
51. Order the following structural levels of skeletal muscle from small to large
- Myofilaments
 - Muscle
 - Sarcomere
 - Myofibril
 - Fascicle
 - Muscle fiber
52. Order the following methods of generating ATP in skeletal muscle during exercise, starting at rest.
- Phosphagen system
 - Oxidative burst from myoglobin
 - Aerobic respiration
 - Glycolysis
53. Order the steps of muscle contraction listed below
- Release of Ca^{2+} ions from terminal cisternae
 - ACh release from motor neuron
 - Myosin binds to actin and sarcomere contraction
 - Tropomyosin shifts from active sites of actin
 - Ca^{2+} binds to troponin
 - Depolarization of muscle cell
54. Order the following steps of bone elongation in long bones listed below
- Chondrocyte death
 - Osteoblasts begin bone deposition
 - Calcification of newly formed cartilage
 - Chondrocytes enlarge
 - Chondrocytes begin multiplying and forming columns

55. Starting from the top of the spine, and moving downwards, order the following groups of vertebrae
- Thoracic Vertebrae
 - Cervical Vertebrae
 - Coccygeal Vertebrae
 - Lumbar Vertebrae
 - Sacral Vertebrae
56. Order the types of contraction the prime mover undergoes when a weightlifter lifts a weight and then sets it down.
- Isotonic eccentric contraction
 - Isotonic concentric contraction
 - Isometric contraction

57. Describe the functions of the radial and ulnar bursa and which fingers they relate to

58. Describe the shape of the spine in the following types of abnormal spinal curvature (Scoliosis, Kyphosis, Lordosis), their causes, and what kinds of people are most at risk of developing them.

59. Explain why cartilage grows/heals at a different rate than other tissues

60. Explain the difference between true, false and floating ribs. Be sure to include how many of each are present.

61. For the following irregularities in skin color, explain the causes, the color of the skin that is affected and from what layer the color originates from. (Epidermis, Dermis, Hypodermis, Blood, etc.)

- Jaundice
- Albinism
- Pallor

62. Explain the difference between rheumatoid arthritis and osteoarthritis

63. Define the following terms, which relate to the roles muscles play during muscle action:

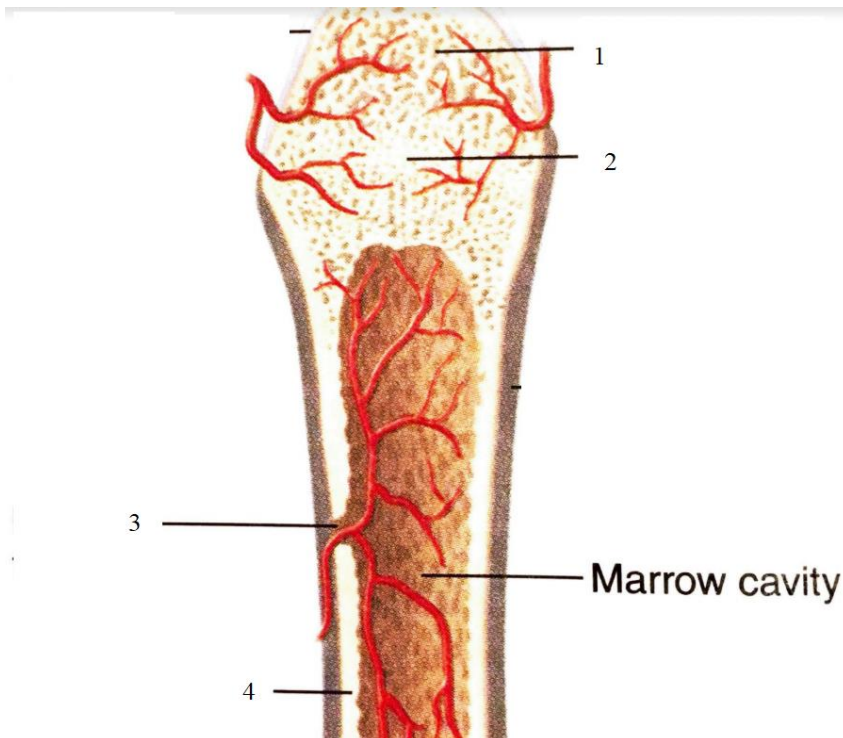
- a. Prime mover/Agonist
- b. Synergist
- c. Antagonist
- d. Fixator

64. Relating to muscle attachment, what is the difference between the origin and the insertion points of a muscle?

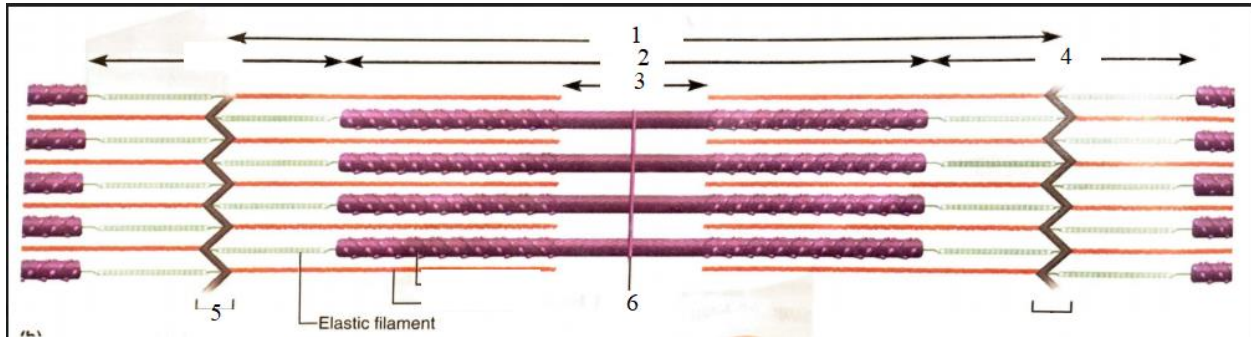
65. What adaptation of the integumentary system makes certain areas of the skin, like the lips, so sensitive?

66. Describe the difference between closed and open reduction of fractures and how long the instruments used in the two techniques stay in place.

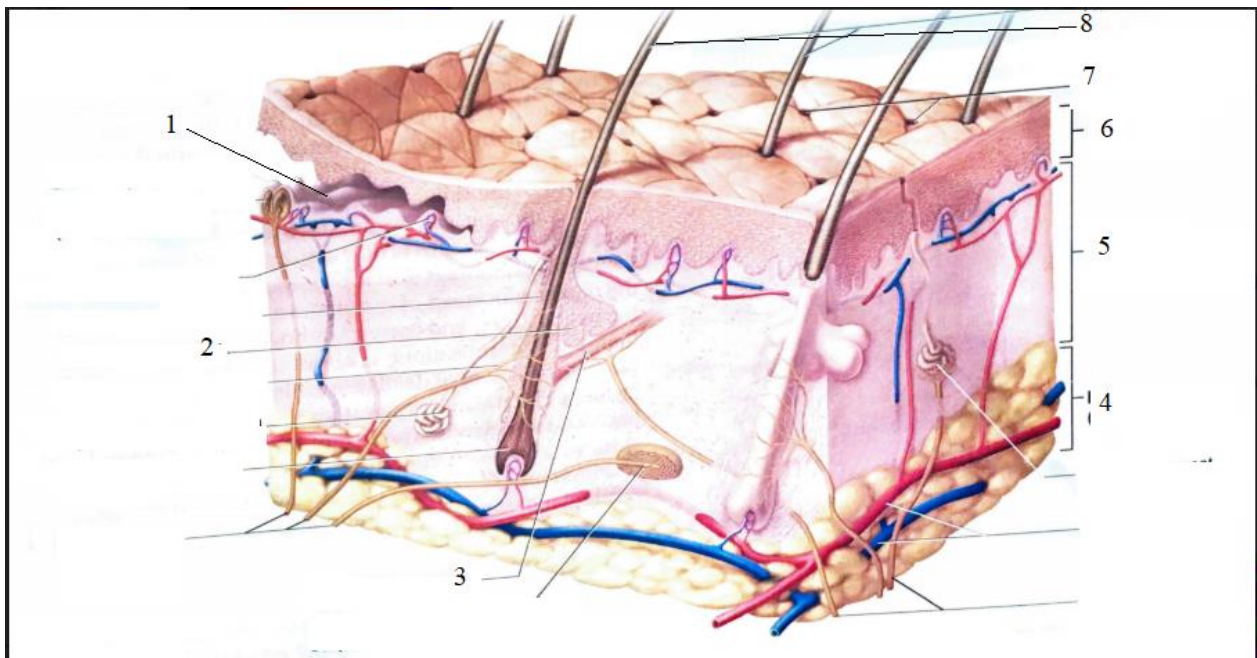
67. Label the following diagram of a bone



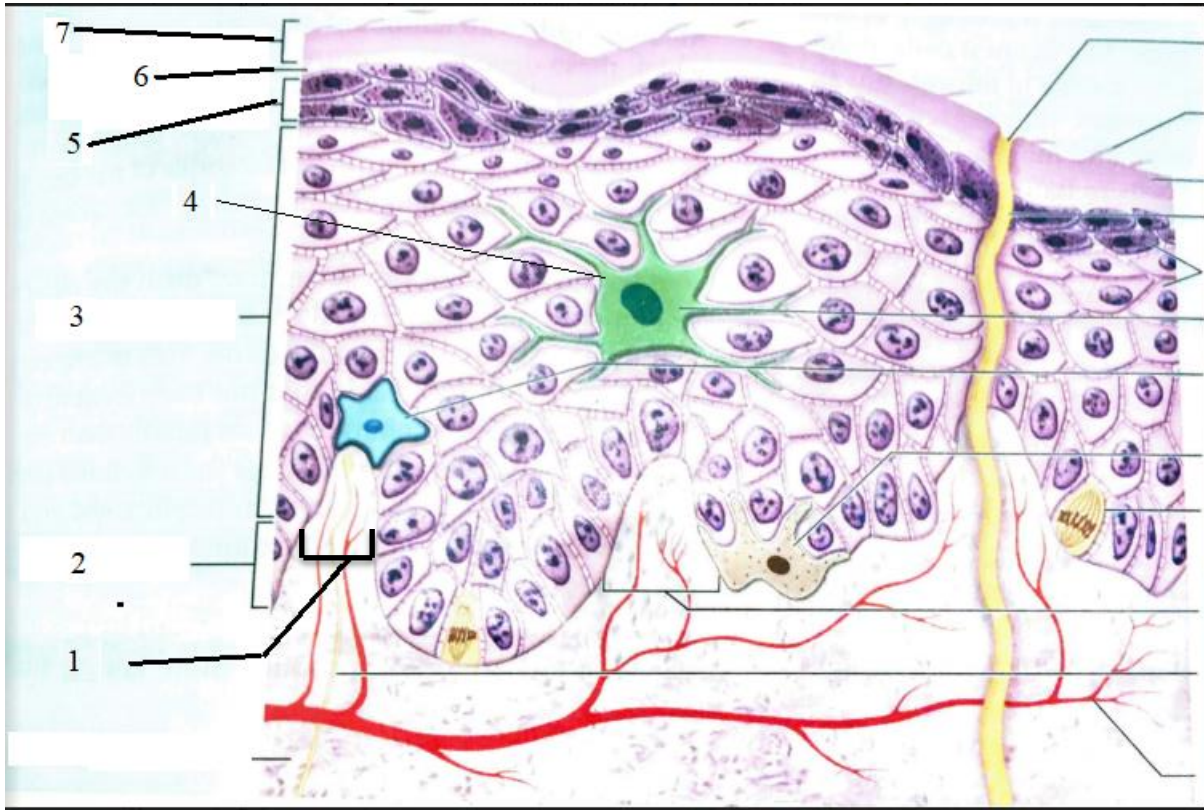
68. Label the following diagram of a sarcomere



69. Label the following diagram of the skin



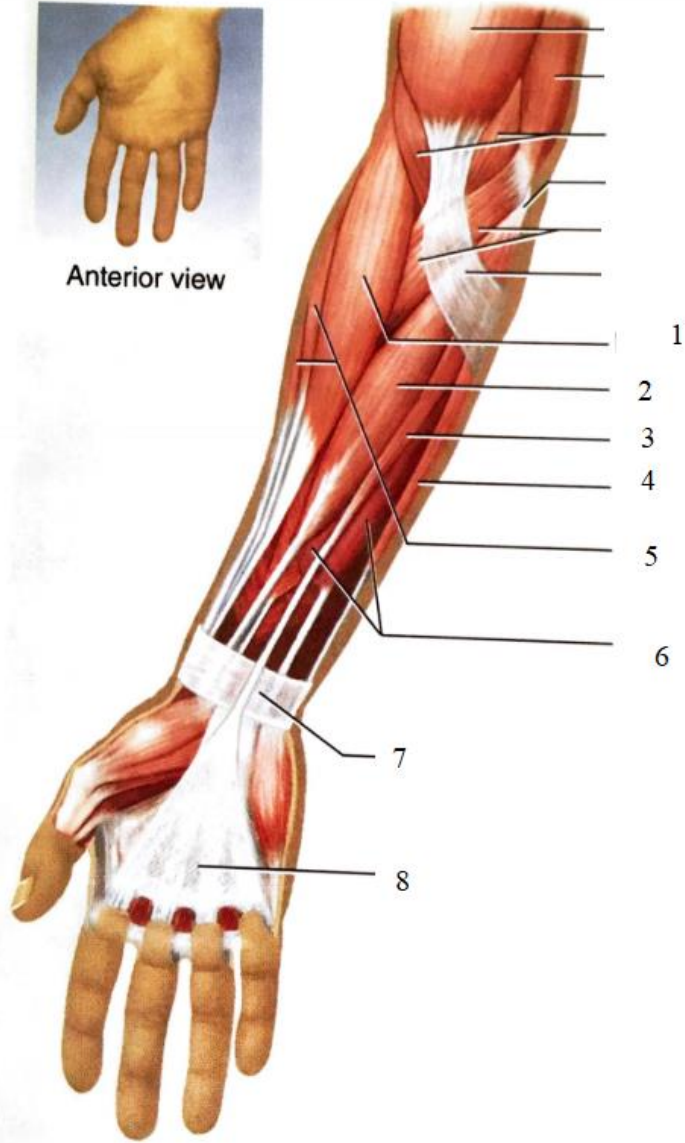
70. Label the following diagram of the epidermis



71. Label the muscles(1-6) and connective tissue (7-8) in the picture below

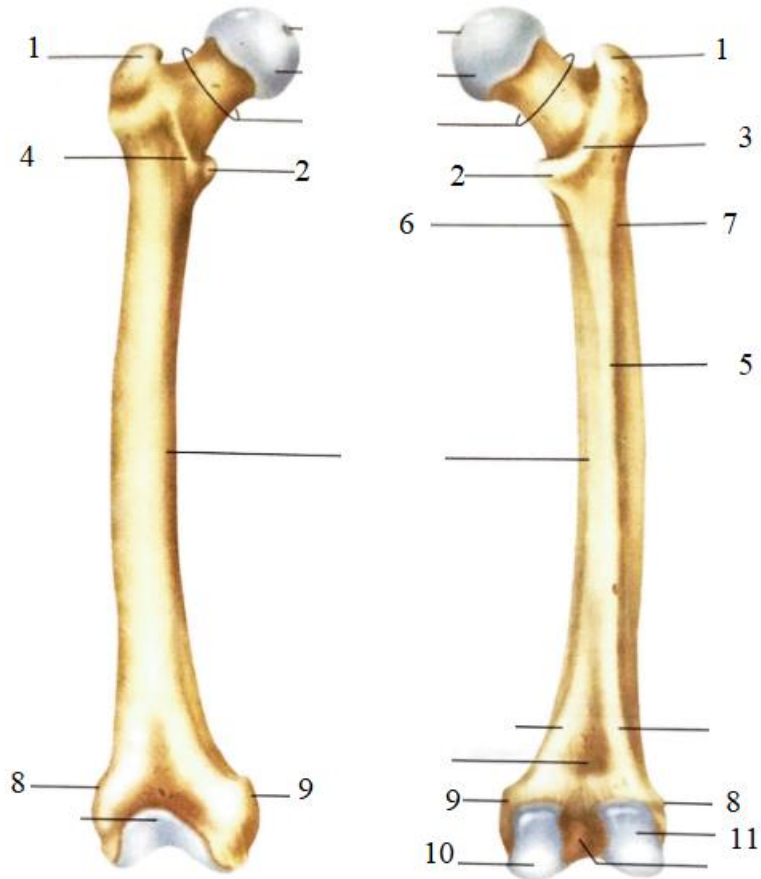


Anterior view



(a) Superficial flexors

72. Label the specific features of the right femur in the picture below



(a) Anterior view

(b) Posterior view

Answer Sheet

Name _____

Team # _____

1. _____

15. _____

29. _____

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16. _____

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4. _____

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44. _____

47. _____

50. _____

45. _____

48. _____

51. _____

52. _____

53. _____

54. _____

55. _____

56. _____

57.

58.

Scoliosis _____

Kyphosis _____

Lordosis _____

59. _____

60.

True _____

False _____

Floating _____

61.

Jaundice _____

Albinism _____

Pallor _____

62. _____

63.

a. _____

b. _____

c. _____

d. _____

64. _____

65. _____

66. _____

67.

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68.

1. _____

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69.

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7. _____

8. _____

70.

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2. _____

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7. _____

71.

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72.

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