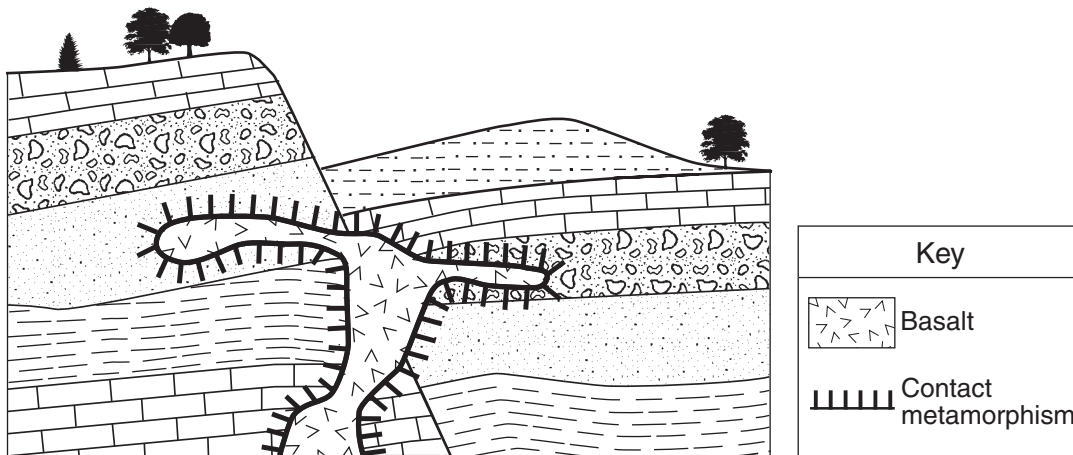


Name _____

Geologic History Regents Review

Base your answers to questions 1 through 3 on the geologic cross section below. The rock layers have not been overturned.



(Not drawn to scale)

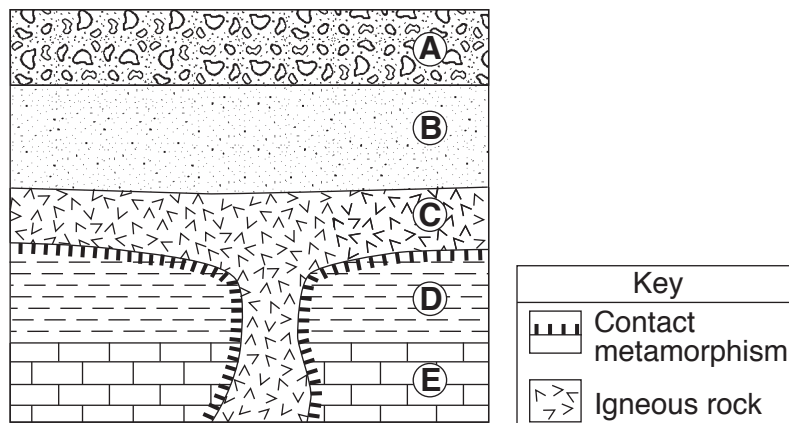
1. The index fossil *Dicellograptus* was found in the shale layer. During which geologic time period did this shale layer form?
2. Describe *one* piece of evidence from the cross section that supports the inference that the fault is older than the basalt intrusion.
3. Explain why carbon-14 could *not* be used to determine the age of the *Dicellograptus* fossil.

The table below shows information about Earth's geologic history. Letter X represents information that has been omitted.

4. Identify *one* important geologic event that occurred in New York State that could be placed in the box at X.

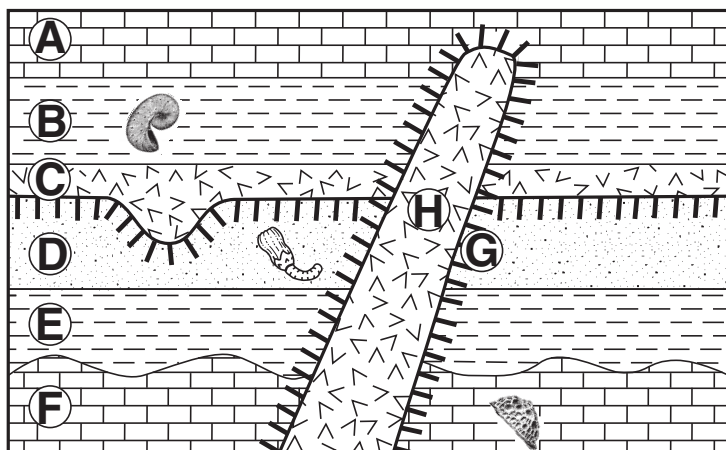
Period	Million Years Ago	Index Fossil Found in Bedrock	Important Geologic Event
Triassic	251 to 200	<i>Coelophysis</i>	X






Base your answers to questions 5 through 7 on the cross section below, which shows rock units A through E that have not been overturned.



5. Identify *one* metamorphic rock that may be found along the boundary between rock units C and E.
6. Describe *one* piece of evidence shown in the cross section that can be used to infer that rock unit A is younger than rock unit B.
7. State the diameter of a particle normally found in rock unit B.

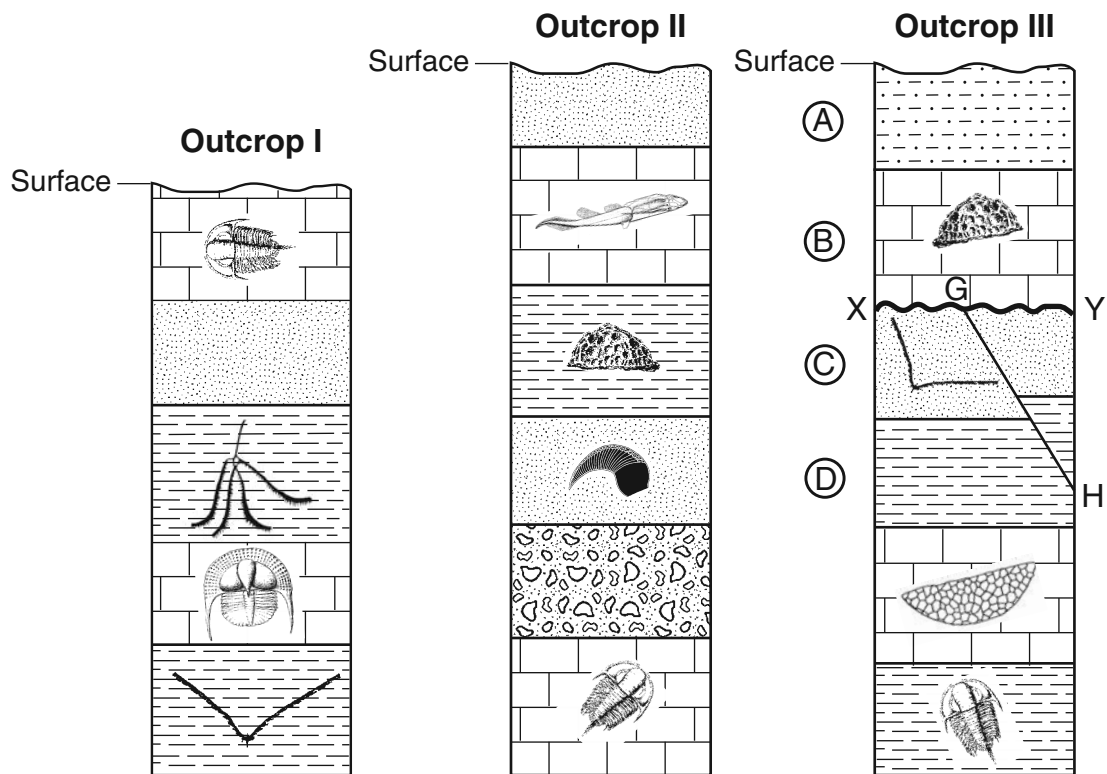
Base your answers to questions 8 through 12 on the geologic section below. Rock units A through H are shown. Several rock units contain fossils. Rock unit G was formed in a zone of contact metamorphism.




Key	
	Igneous rock
	Contact metamorphism
	Ammonoid (Cretaceous Period)
	Crinoid (Mississippian Period)
	Coral (Devonian Period)

8. Place *two* **Xs** on the cross section above to show the location of *two* unconformities that formed at different times in geologic history.
9. Identify *two* possible geologic periods during which the sediments that formed rock unit E could have been deposited.
10. Describe the evidence shown in the cross section that indicates that rock unit C is younger than rock unit D.
11. Identify the letter of the rock unit that was formed at the same time as igneous rock unit H.
12. Identify *one* geologic period during which igneous intrusion H could have formed.
13. Explain why the absolute age of the fossils shown in the cross section can *not* be determined by using radioactive carbon-14.

Base your answers to questions 14 through 16 on the cross sections below, which show widely separated outcrops labeled I, II, and III. Index fossils are found in some of the rock layers in the three outcrops. In outcrop III, layers A, B, C, and D are labeled. Line XY represents an unconformity. Line GH represents a fault.



14. Describe *one* characteristic necessary for a fossil to be classified as an index fossil.

15. On outcrop II on the diagram above, place the symbol  for an unconformity between the two rock layers where the Silurian-age bedrock has been removed by erosion.

16. List in order from oldest to youngest, the relative age of the four rock layers, A,B,C, and D, fault GH, and unconformity XY shown in outcrop III.

_____, _____, _____, _____, _____, _____

Oldest  Youngest

Base your answers to questions 17 through 21 on the passage and map below. Point F on the map shows the location where an unusual fossil was found.

Fossil Jaw of Mammal Found in South America

Paleontologists working in Patagonia have found the tiny fossil jaw that may be the first evidence of early mammals in South America.

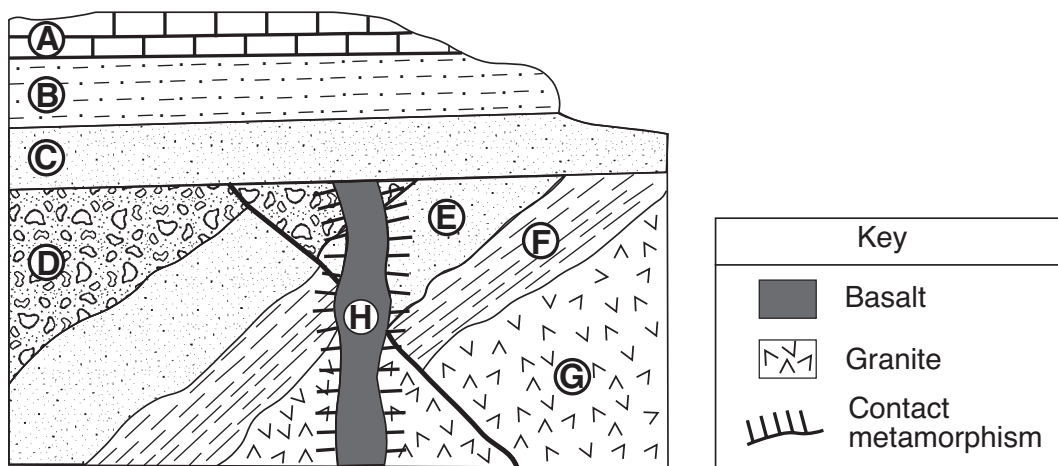
The fossil, which measures less than a quarter-inch long, is believed to be from the middle or late Jurassic Period. Researchers said it suggests that mammals developed independently in the Southern Hemisphere.

The fossil, named *Asfaltomylos patagonicus*, was discovered in a shale formation in Patagonia. Dinosaurs were the dominant land animal at that time. Mammals were tiny, and hunted insects in the dense tropical vegetation. The now-arid region also has yielded some remarkable dinosaur fossils from the same period in a vast ancient boneyard covering hundreds of square miles.



17. State the latitude and longitude of point F, to the *nearest degree*, where the fossil *Asfaltomylos patagonicus* was discovered. Include the correct units and compass directions in your answer.
18. State the name of the dominant sediment particle that was compacted to form the shale in which this fossil was found.
19. What other life-form first appeared on Earth during the geologic period when *Asfaltomylos patagonicus* existed?
20. State *one* method used by geologists to determine the age of the bedrock in which this ancient mammal fossil was found.
21. Explain how the uplift of the Andes Mountains changed eastern Patagonia's climate from a wet tropical forest at the time *Asfaltomylos patagonicus* lived to the arid conditions of today.

Base your answers to questions 22 through 26 on the cross section below. Letters A through H represent rock units in which overturning has not occurred.



22. Identify *one* metamorphic rock that could have formed at the boundary between rock unit E and rock unit H.

23. Rock unit B contains fossils of *Centroceras* while rock unit F contains fossils of *Tetragraptus*. Identify *one* geologic time period when rock unit D could have formed.

24. Two Inferences about the cross section are listed below.

Inference 1: Rock unit G is older than the fault

Inference 2: Rock unit A is younger than rock unit C.

Explain how *each* inference is supported by evidence in the cross section.

1.

2.

25. Identify *two* processes that formed rock unit D from sediment.

26. State the diameter of a particle normally found in rock unit B.

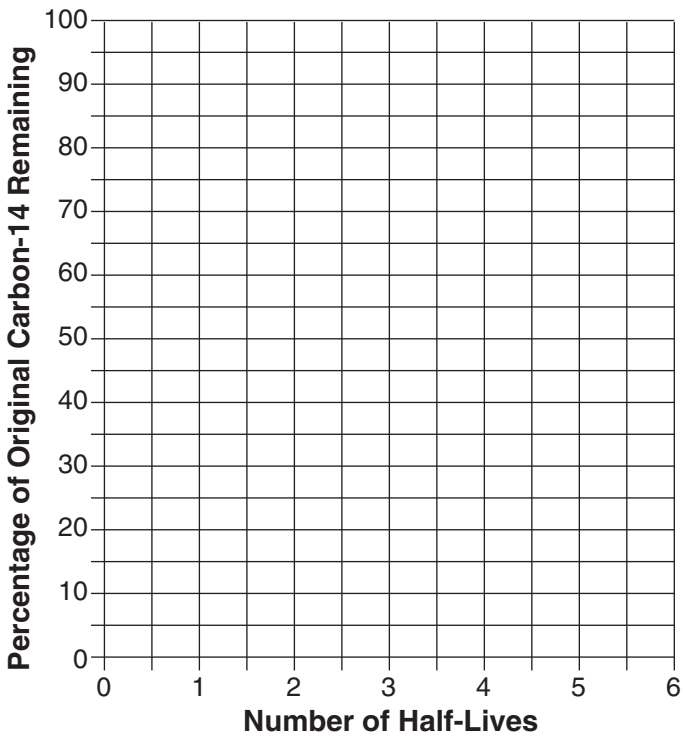
Base your answers to questions 27 through 29 on the data table below, which shows the radioactive decay of carbon-14. The number of years required to complete four half-lives has been left blank.

Radioactive Decay of Carbon-14

Number of Half-Lives	Percentage of Original Carbon-14 Remaining	Time (years)
0	100	0
1	50	5700
2	25	11,400
3	12.5	17,100
4	6.3	
5	3.1	28,500
6	1.6	34,200

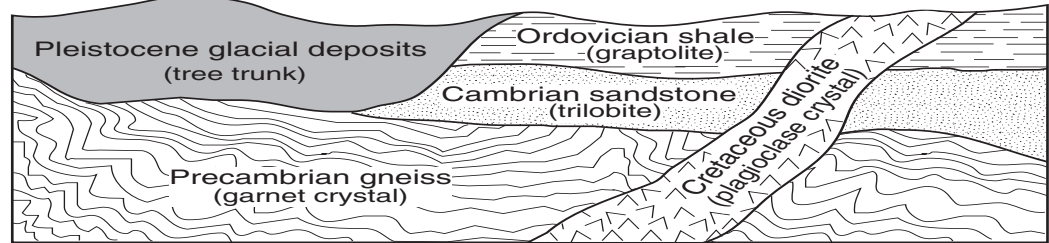
27. On the grid below, construct a graph that shows the radioactive decay of carbon-14 by plotting an **X** to show the percentage of original carbon-14 remaining after *each* half-life. Connect the **Xs** with a smooth, curved line.

Radioactive Decay of Carbon-14



28. How long does it take for radioactive carbon-14 to complete four half-lives?

29. The cross section below shows part of Earth’s crust. The objects in parentheses indicate materials found within each rock unit or deposit.



Which object in parentheses could be accurately dated using carbon-14? Explain your answer.

