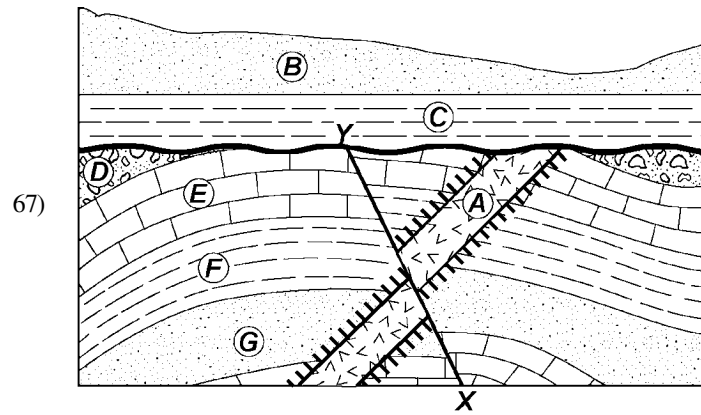


- 1) D 2) C 3) B 4) D 5) A
 6) B 7) D 8) C 9) B 10) C
 11) A 12) A 13) D 14) C 15) A
 16) B 17) C 18) D 19) B 20) C
 21) D 22) B 23) A 24) D 25) C
 26) B 27) A 28) A 29) B 30) A
 31) C 32) D 33) C 34) A 35) B
 36) A 37) D 38) C 39) D 40) B
 41) C 42) B 43) B 44) C 45) D
 46) D 47) A 48) D 49) C 50) B

- 51) SAMPLE ANSWERS: They are formed over a short period of time. OR They are geographically widespread.
- 52) **3:** Deposition of rock unit C; **1:** Intrusion of rock unit D; **2:** Faulting along line AB
- 53) quartzite OR hornfels
- 54) SAMPLE ANSWERS: deposition OR cementation OR compaction OR burial
- 55) 0.0004 to 0.006 cm
- 56) Cambrian OR Ordovician OR Silurian OR Devonian Period.
- 57) SAMPLE ANSWERS: Evidence for inference 1: A fault is younger than any rock through which it cuts. OR Rock unit G had to be in place before it was cut by the fault. OR law of crosscutting relationships; Evidence for inference 2: Rock unit C is below rock unit A. OR Younger sedimentary rock is deposited on top of older sedimentary rock. OR law of superposition
- 58) SAMPLE ANSWERS: The shale and sandstone were metamorphosed by the heat of the lava. OR The lava flow heated the rocks that it flowed over. OR Contact metamorphism changed the top layer of formation A. OR Heat and pressure formed hornfels and quartzite. OR metamorphism/recrystallization
- 59) SAMPLE ANSWERS: Faulting displaced the sandstone layer. OR Two Peaks sandstone was broken by faults in two locations. OR faulting
- 60) SAMPLE ANSWERS: potassium feldspar or orthoclase OR quartz OR plagioclase feldspar OR biotite or mica OR muscovite OR amphibole or hornblende
- 61) clay OR a size equal to or less than 0.0004 cm
- 62) SAMPLE ANSWERS: cooling OR solidification OR crystallization OR melting OR intrusion/intruding
- 63) marble OR hornfels
- 64) SAMPLE ANSWERS: Basalt cuts across all other rock units. OR Contact metamorphism is shown between the basalt and all rock layers.
- 65) Ordovician Period

66) SAMPLE ANSWERS: quartzite OR hornfels



68) SAMPLE ANSWERS: The layers of folded rocks show displacement on both sides of the fault line. OR The fault cuts across the folded rocks. OR XY cuts across the igneous intrusion which crosscuts the folded rocks.

69) SAMPLE ANSWER: Ordovician Period

70) SAMPLE ANSWERS: Crystal size: fine grained OR less than 1-mm crystal size; Explanation: The magma cooled rapidly. OR It cooled over a short period of time.

71) quartzite OR hornfels

72) SAMPLE ANSWERS: The intrusion has not been broken and offset. OR The igneous rhyolite cuts across the fault.

73) Devonian Period

74) SAMPLE ANSWERS: The valley is U-shaped. OR The valley has grooved, scratched, and polished bedrock.

75) ○ OR Circle fossil

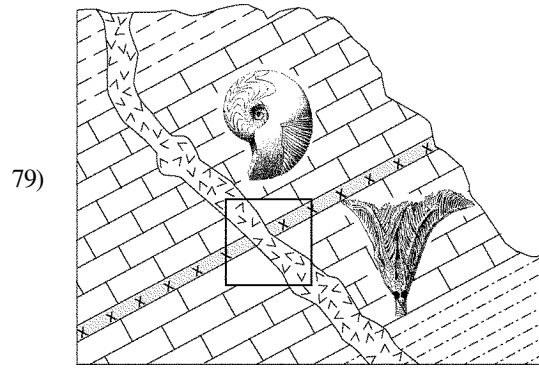
SAMPLE ANSWERS: The fossil was found only in the Devonian layer/one layer in each outcrop. OR The fossil was geographically widespread. OR The fossil indicates a short existence in geologic time/limited time interval.

76) Outcrop 2

SAMPLE ANSWERS: The rock layers of the same age as those shown in outcrop 2 are all found in New York State. OR Permian Period rock is not present in New York State, but is shown in outcrops 1 and 3.

77) SAMPLE ANSWERS: The bedrock in the outcrops formed during the Paleozoic Era, and *Coelophysis* lived during the Mesozoic Era. OR The youngest rock layer is from the Permian, and *Coelophysis* did not exist yet. OR *Coelophysis* lived at a much later time. OR No Triassic bedrock is shown. OR Layers containing *Coelophysis* have been removed by erosion.

78) SAMPLE ANSWERS: Carbon-14 has a short half-life. OR These rock layers are too old to contain measurable carbon-14. OR Carbon-14 is used to date recent remains. OR No organic material remains in the rock.

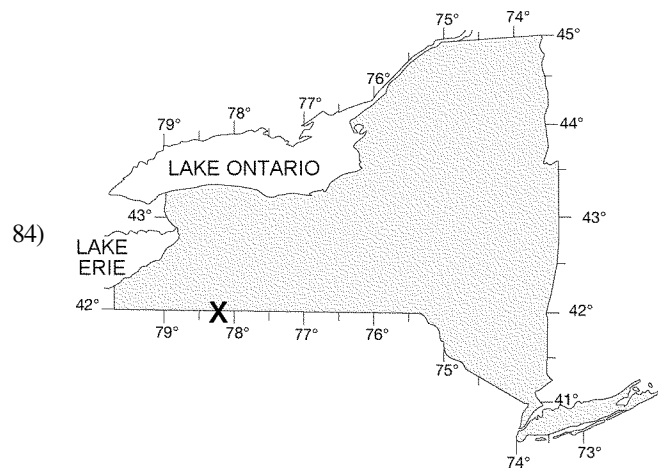


80) SAMPLE ANSWERS: The horizontal rocks are on top of the tilted layers. OR Fossils of the earliest grasses and large carnivorous mammals are more recent than *Manticoceras* and *Ctenocrinus*. OR The fossils in the tilted layers are older.

81) 251 million years

82) Canadaway

83) brachiopods OR *Mucrospirifer*



85) Avalon

86) clear, shallow water

87) Fordham gneiss OR gneiss

88) SAMPLE ANSWERS: The marble shows deformation. OR The rock formation is folded. OR The marble is located between two other regional metamorphic rocks.

89) SAMPLE ANSWERS: uplift or folding OR erosion OR weathering OR subsidence or submergence OR deposition

90) SAMPLE ANSWERS: From point *A* to point *B*, the age of the surface bedrock decreases and from *B* to *C*, the age of the surface bedrock increases. OR The surface bedrock at point *B* is younger than the surface bedrock at point *A* and point *C*. OR gets younger, then older

91) Cenozoic Era

92) Quaternary Period and Pleistocene Epoch

93) SAMPLE ANSWERS: mastodon OR beluga whale OR condor OR humans

- 94) SAMPLE ANSWERS: The rate at which water infiltrates the soil will decrease if the soil is frozen. OR Frozen ground is mostly impermeable. OR Ice fills the pore spaces. OR The ground is frozen. OR The soil is composed of small particles.
- 95) Mesozoic Era
- 96) SAMPLE ANSWERS: Similar fossil remains are found in Africa and South America OR The fossil *Rugops primus*, found in Africa, is related to abelisaurids found in South America and India OR fossil evidence
- 97) Any specific sedimentary rock, such as shale.
- 98) SAMPLE ANSWERS: wide geographic distribution or widespread OR lived a short period of geologic time or short lived OR easily recognizable
- 99) SAMPLE ANSWER: divergence OR rifting OR seafloor spreading