

APOLLO

Greenhouse effect

HL

Physics

First assessment 2025

6 questions | questions

11. What is a primary cause of the enhanced greenhouse effect?

- A. Melting of ice at Earth's poles
- B. Increases in volcanic activity
- C. Deforestation of rainforests
- D. Burning of fossil fuels

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10. The albedo of the atmosphere above a small region on the Earth's surface is 0.25. The solar constant is S .

What is the incoming intensity of solar radiation incident on this region when the Sun is directly overhead?

A. $\frac{3S}{16}$

B. $\frac{S}{4}$

C. $\frac{3S}{4}$

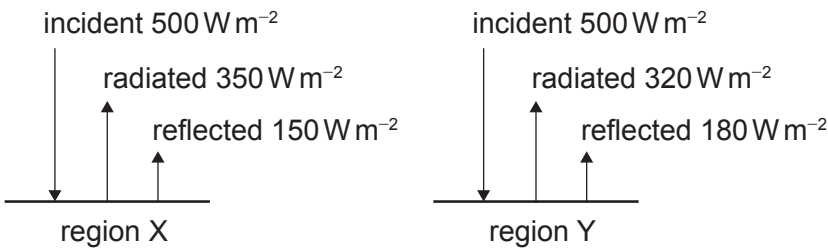
D. S

- 13.** The albedo of a planet with no atmosphere is 0.25. The reflected intensity is 240 W m^{-2} .

What is the outgoing radiated intensity?

- A. 180 W m^{-2}
- B. 300 W m^{-2}
- C. 720 W m^{-2}
- D. 960 W m^{-2}

11. The diagram shows the incident, radiated and reflected intensities of the solar radiation for two regions X and Y on the surface of Earth. X and Y have the same surface temperature.



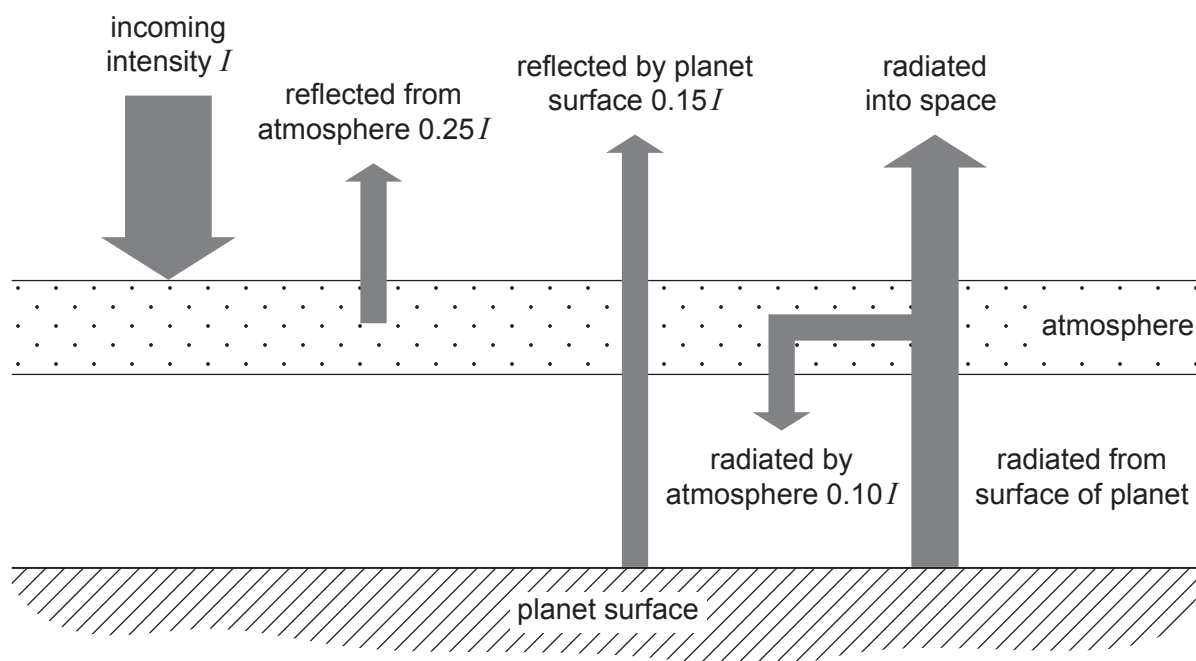
Which region has a greater albedo, and which region has a greater emissivity?

	Greater albedo	Greater emissivity
A.	X	X
B.	Y	X
C.	X	Y
D.	Y	Y

Turn over
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- 12.** Which process involving gas molecules in the Earth's atmosphere is the main cause of the greenhouse effect?
- A. Reflection of incoming solar radiation
 - B. Absorption and re-radiation of incoming solar radiation
 - C. Reflection of outgoing infrared radiation
 - D. Absorption and re-radiation of outgoing infrared radiation

12. The energy balance model of a planet's climate is shown. The reflected and radiated intensities are given in terms of the incident incoming intensity I .



What is the radiated intensity from the surface of the planet?

- A. $0.40 I$
- B. $0.50 I$
- C. $0.70 I$
- D. $1.10 I$

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