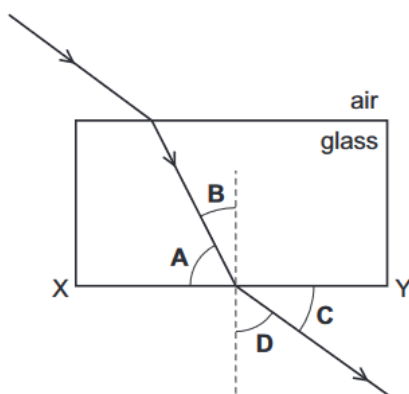
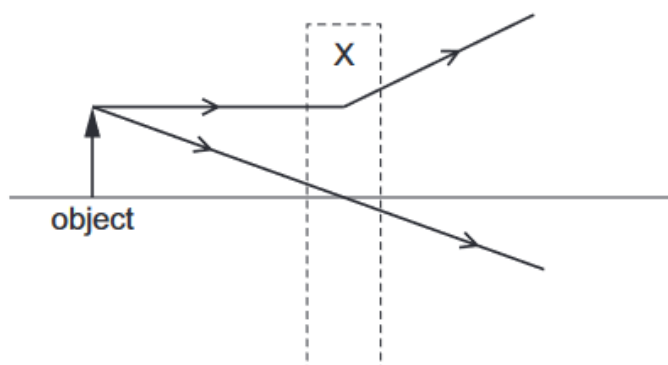


- 20 A ray of light passes into a glass block. It travels through the glass block and then emerges into the air.

Which angle is the angle of refraction at the surface XY?



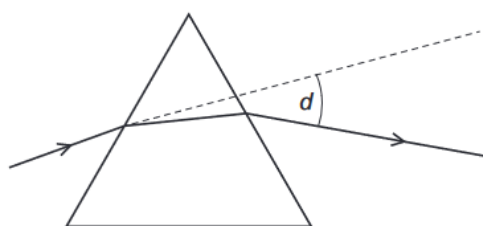
- 21 Two rays of light pass through a lens in region X.



Which type of lens is in region X and which type of image is formed?

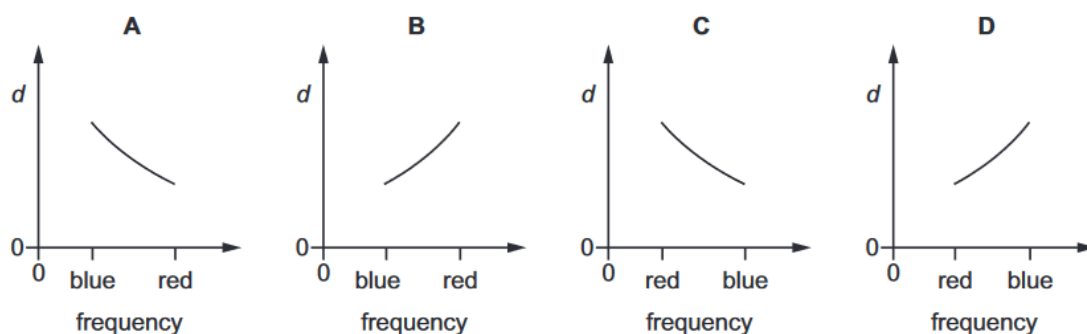
	type of lens	type of image
A	converging	real
B	converging	virtual
C	diverging	real
D	diverging	virtual

23 Light rays are deviated by a prism.

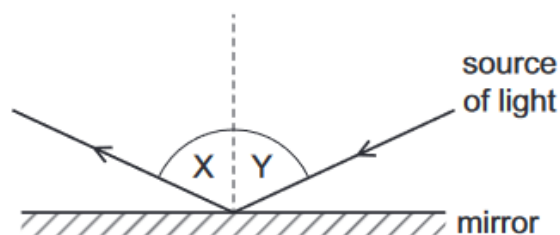


The deviation angle d is measured for light rays of different frequency, including blue light and red light.

Which graph of d against frequency is correct?



23 Light reflects from a plane mirror as shown.



Which row is always correct?

	symbol of angle X	relationship between X and Y
A	i	$X = Y$
B	i	$X + Y = 90^\circ$
C	r	$X = Y$
D	r	$X + Y = 90^\circ$

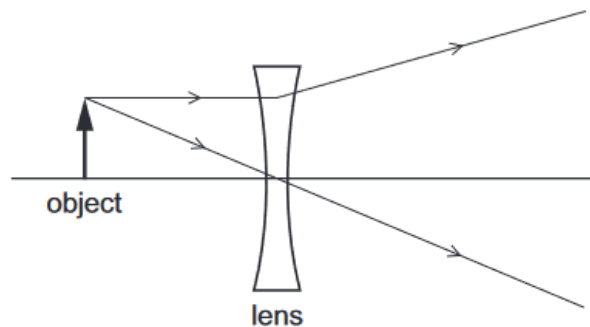
24 A piece of paper torn from an exercise book is shown.

	The object is further away from the lens
	than the focal point and the image is
	upside down.

Which process is being described?

- A the formation of a virtual image by a diverging lens
- B the formation of a virtual image by a converging lens
- C the formation of a real image by a diverging lens
- D the formation of a real image by a converging lens

24 The diagram shows the paths of two rays from the top of an object through a lens.



The object is viewed from the opposite side of the lens to the object.

How does the image compare with the object?

- A larger and inverted
- B larger and the same way up
- C smaller and inverted
- D smaller and the same way up

29 Which device uses total internal reflection?

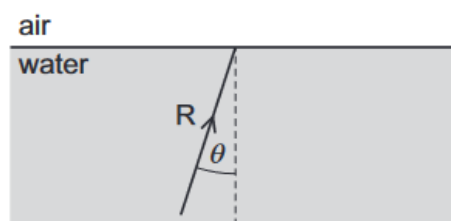
- A** magnifying glass
- B** optical fibre
- C** photographic enlarger
- D** projector

28 Which statement about blue light is correct?

- A** Blue light has a smaller frequency than red light.
- B** Blue light has a longer wavelength than red light.
- C** Blue light has the same speed in glass as red light.
- D** Blue light is refracted more by a glass prism than red light.

28 A ray of light R is incident on a water-to-air surface with an angle of incidence θ .

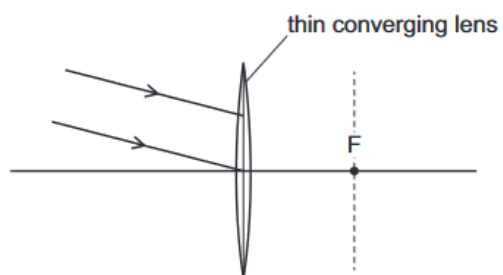
The angle θ is less than the critical angle c .



Which statement describes the subsequent path of R?

- A** It travels back into the water with an angle of reflection equal to c .
- B** It travels back into the water with an angle of reflection greater than c .
- C** It travels into air with an angle of refraction greater than θ .
- D** It travels into air with an angle of refraction smaller than θ .

- 29 A parallel beam of light is incident on a thin converging lens.



F is one focal point of the lens.

Which ray diagram shows the light after it has passed through the lens?

