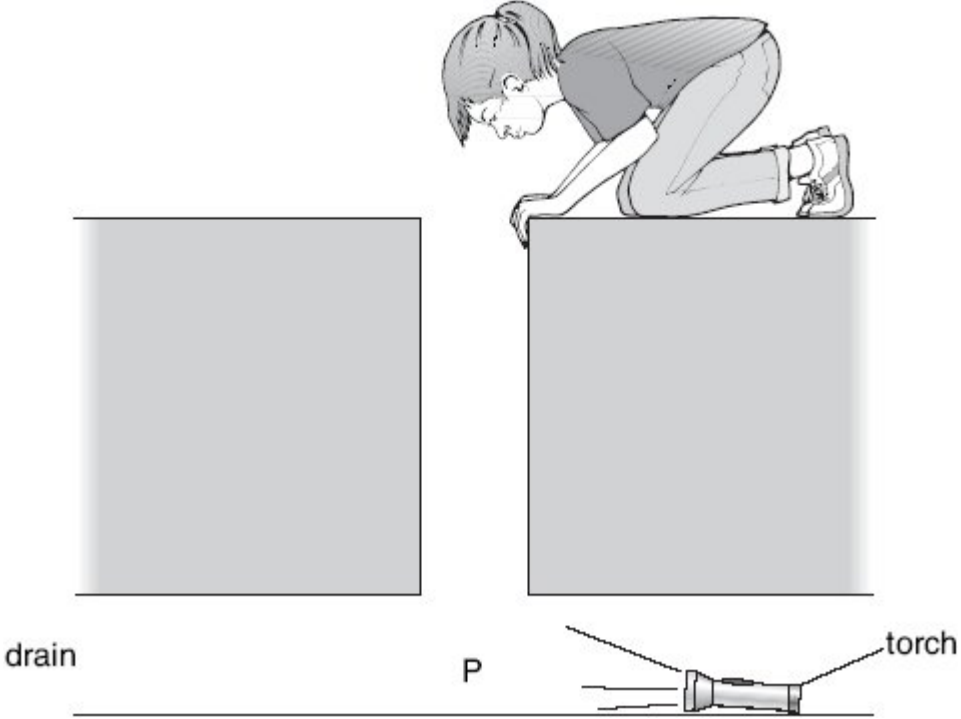


1

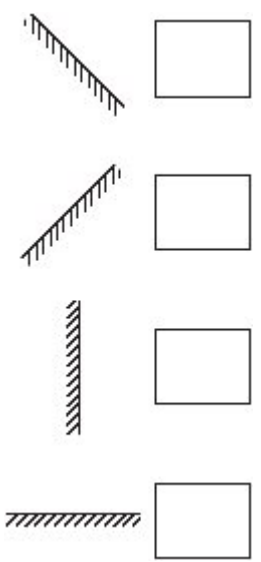
Jenny dropped her torch down a drain.
The torch was still switched on but Jenny could **not** see it.



not to scale

(a) (i) Jenny lowered a mirror into the drain and placed it at position P.

At which angle should Jenny put the mirror to see the torch?
Tick the correct box.



1 mark

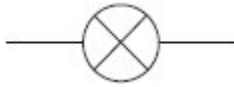
(ii) What happens to the light from the torch when it hits the mirror?

.....

1 mark

(b) The diagrams below show the symbols for three parts of the torch circuit.

(i) On the line below each diagram, give the name of the part.



.....

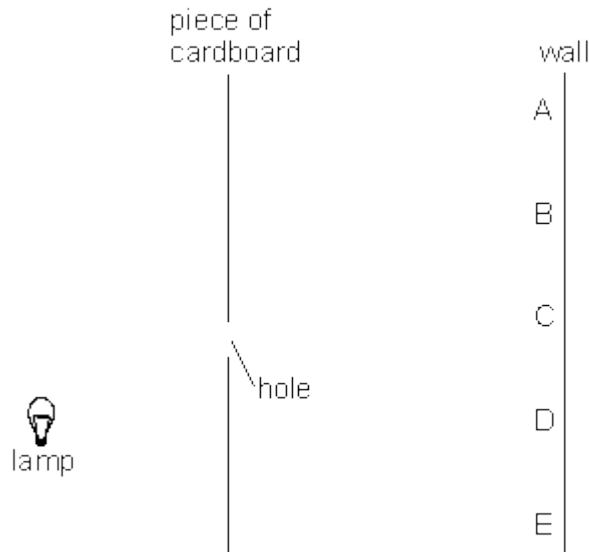
3 marks

(ii) In the space below, draw a circuit diagram to show how these **three** parts are connected in a torch.

1 mark
maximum 6 marks

2

The diagram shows a lamp and a piece of cardboard. The piece of cardboard has a hole in it. Light from the lamp passes through the hole and forms a bright spot on a wall.



(a) (i) Which point on the wall, A B, C, D or E, is lit up by the lamp?

.....

1 mark

(ii) Explain why the **other** points on the wall are **not** lit up by the lamp.

.....

.....

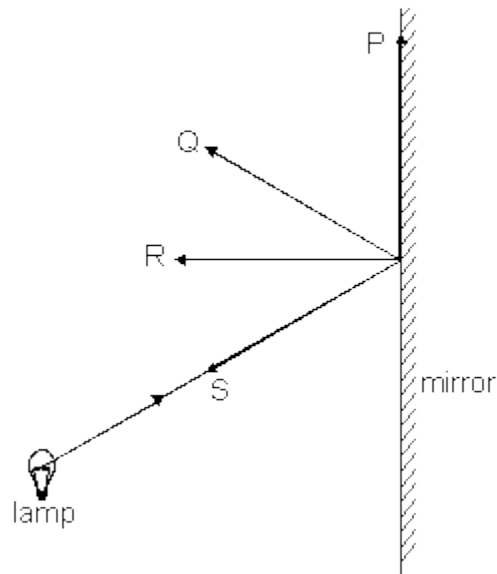
1 mark

(b) A piece of clear green plastic is placed over the hole. What is the colour of the light which shines on the wall?

.....

1 mark

(c) The diagram shows a ray of light from a lamp hitting a mirror.



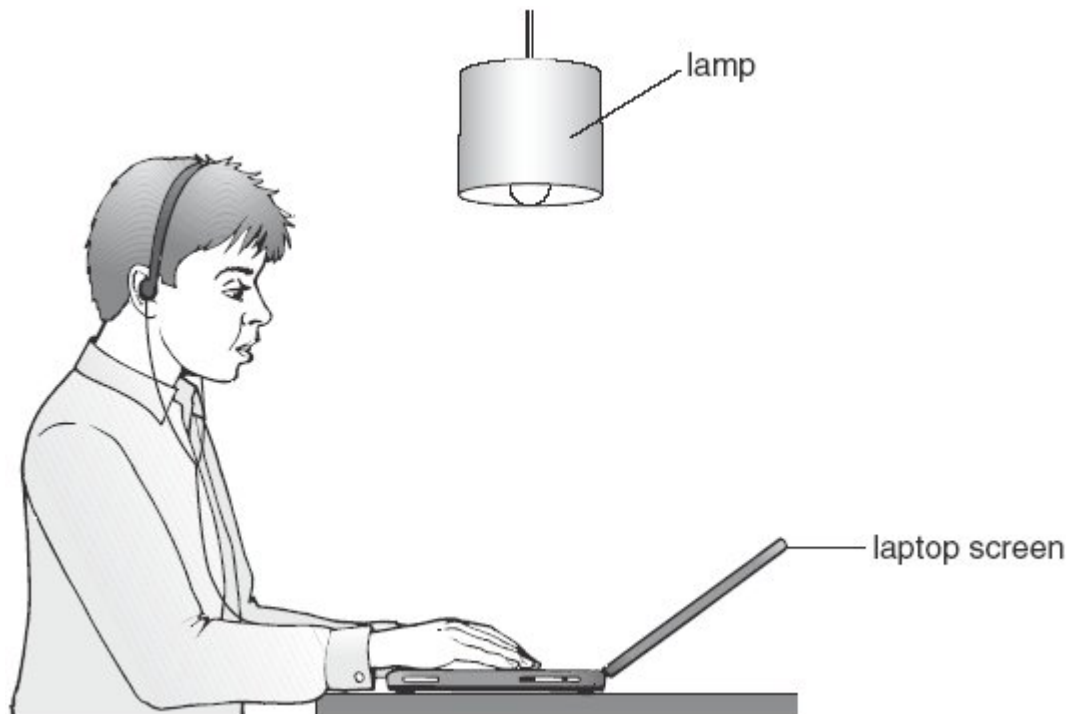
Which arrow, P, Q, R or S, shows the reflected ray?

.....

1 mark
Maximum 4 marks

3

(a) The diagram below shows George using his laptop. Light from the lamp is reflected by the laptop screen.

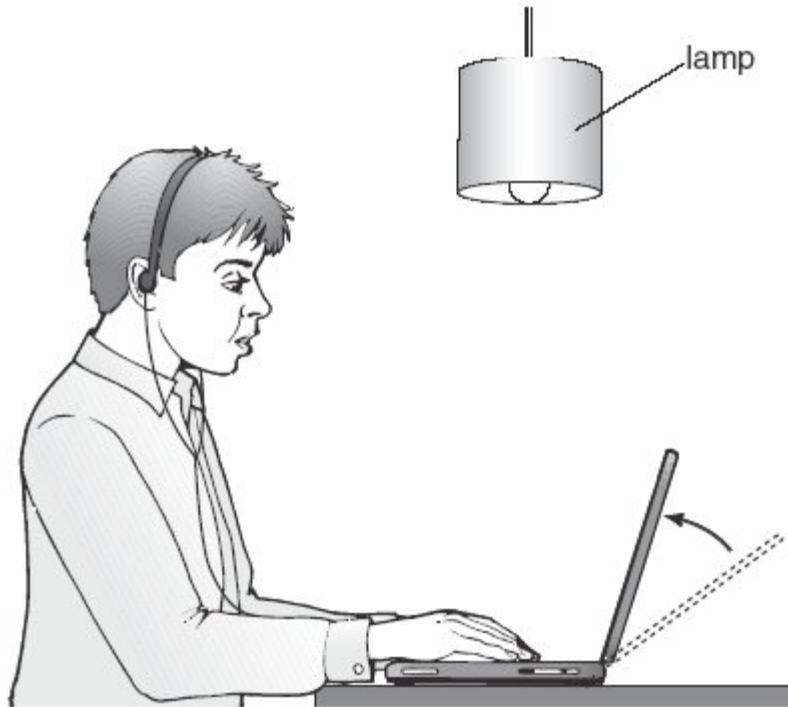


(i) **On the diagram above** draw a ray of light to show how George sees the light from the lamp reflected by the laptop screen. Use a ruler.

Draw arrows to show the direction of light.

3 marks

- (ii) With the laptop screen in the position shown in part a(i), George sees an image of the lamp on the screen.
George tilts the screen forwards as shown below.



When the screen is tilted forwards it is easier for George to see the words on the screen.

What happens to the reflected ray of light when the screen is tilted?

.....
.....

1 mark

- (b) George listens to music on his headphones.

Complete the sentence below using words from the box.

| | | |
|-----------------|-------------------|--------------------------------|
| chemical | electrical | gravitational potential |
| sound | thermal | |

The useful energy change in the headphones is from

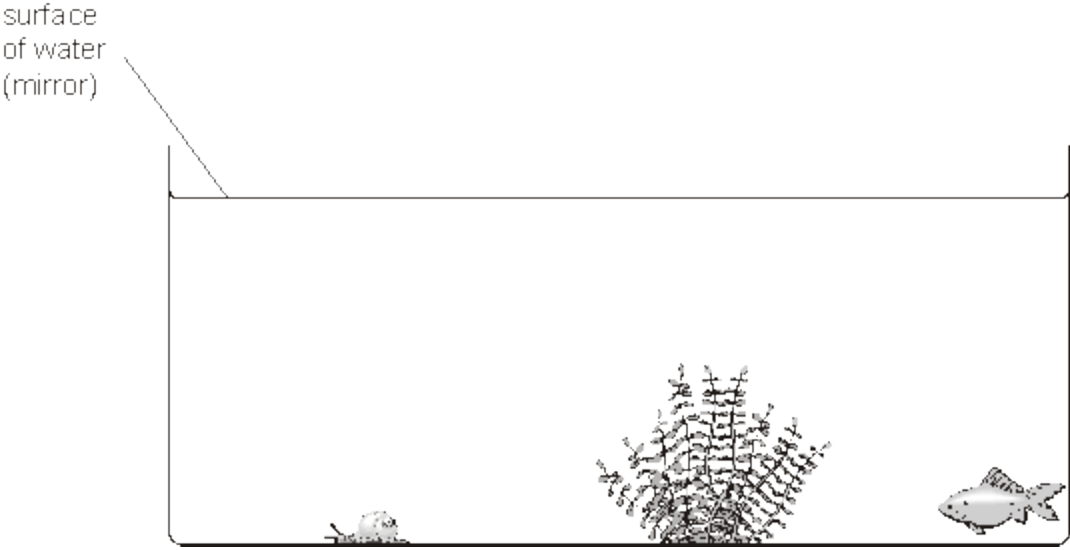
energy into energy.

1 mark
maximum 5 marks

4

(a) The diagram below shows a fish tank.

The surface of the water acts like a mirror.
The fish can see the snail reflected in the surface of the water.

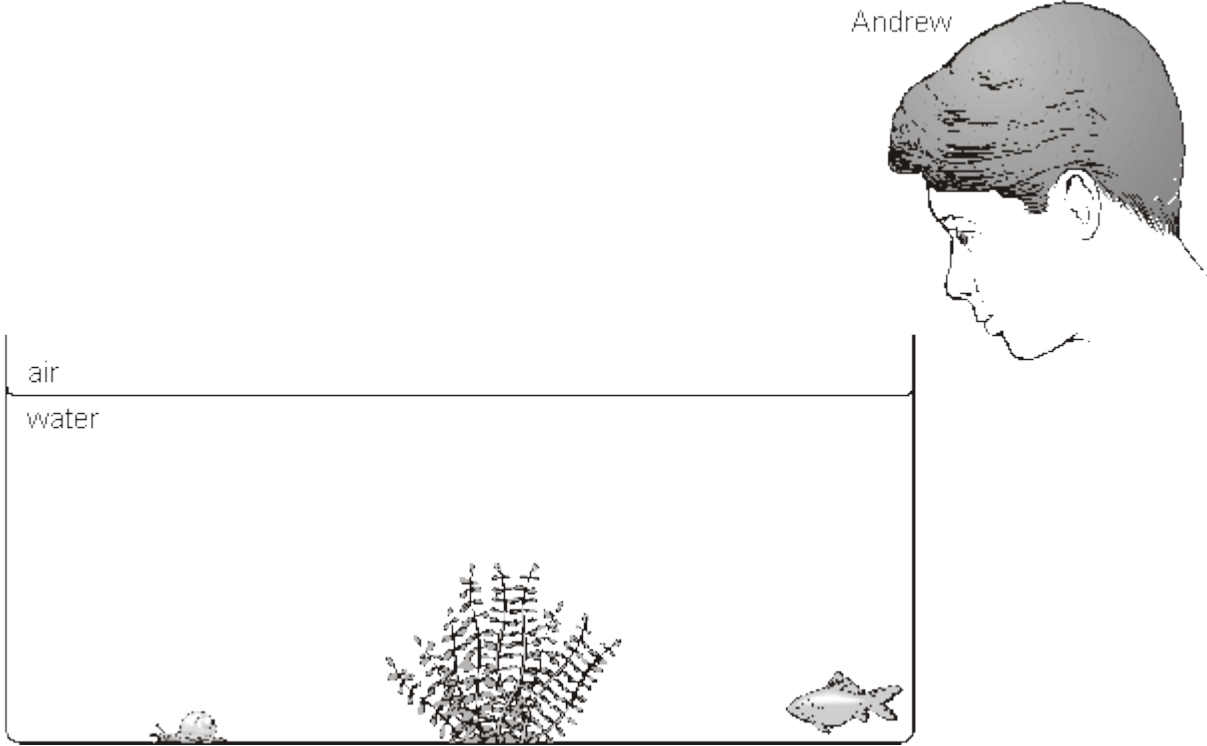


Draw a ray of light which passes from the snail, and reflects from the surface, to show how the fish can see the snail. Use a ruler.

Put arrows on the ray of light.

3 marks

(b) Andrew is looking at the snail.



When a ray of light passes from water to air it changes direction.

- (i) Draw a ray of light from the snail to Andrew to show how Andrew can see the snail. Use a ruler.

Put arrows on the ray of light.

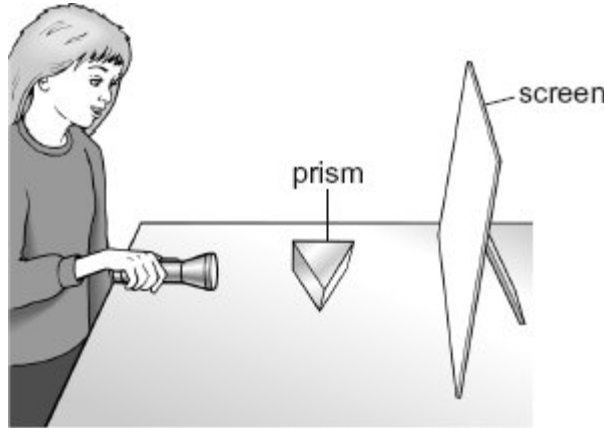
2 marks

- (ii) What is the name given to this change in the direction of a ray of light?

.....

1 mark
maximum 6 marks

5 Ann shines a ray of white light at a glass prism.

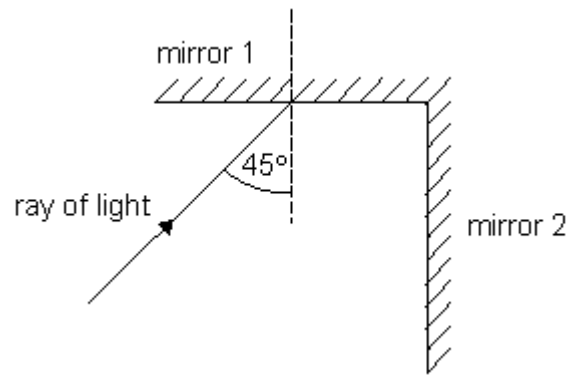


- (a) Tick one box in each row to show if each sentence is **true** or **false**.

| | true | false |
|--|--------------------------|--------------------------|
| The light refracts as it enters the prism. | <input type="checkbox"/> | <input type="checkbox"/> |
| The light refracts as it travels through the prism. | <input type="checkbox"/> | <input type="checkbox"/> |
| The light disperses as it leaves the prism. | <input type="checkbox"/> | <input type="checkbox"/> |
| The light forms a spectrum of colours on the screen. | <input type="checkbox"/> | <input type="checkbox"/> |

2 marks

(b) Ann places two mirrors at 90° and shines a ray of light at mirror 1.



(i) **On the diagram above** continue the ray of light to show how it is reflected by both mirrors. Use a ruler.

2 marks

(ii) **On the diagram above** label the incident ray (i) and the reflected ray (r) for the light striking **mirror 2**.

1 mark

(c) Ann shines the torch at a red book.

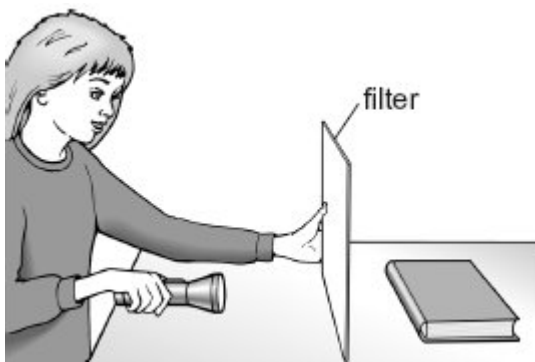


Explain why the object looks red in white light.

.....
.....

2 marks

- (d) In a dark room, Ann puts different coloured filters in front of the torch. She records the colour the book appears.



Complete the table below to show the colour that the book would appear. Tick **one** box in each row. The first one has been done for you.

| colour of filter | What colour does the red book appear? | | |
|------------------|---------------------------------------|-------|-------|
| | red | green | black |
| no filter | ✓ | | |
| red filter | | | |
| green filter | | | |

1 marks
maximum 8 marks