*Name:_____*   Practice worksheet   Grade 7

1   The diagram shows a flask with air trapped inside it.
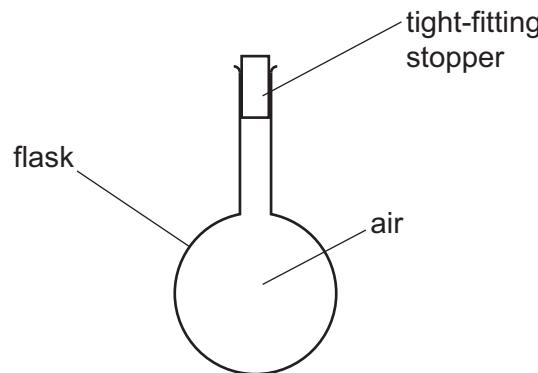
Initially, the flask and air are at room temperature. The flask is then cooled in a refrigerator.

(a) State the change in the pressure of the air in the flask as the air cools.

.... [1]

(b) Explain your answer to **(a)**.

....

....

....

.... [3]

[Total: 4]

2   A rigid container is filled with a gas.

The gas in the container is heated. The volume of the gas does **not** change.

State and explain the change in pressure of the gas as the temperature of the gas increases.

....

....

....

.... [3]

[Total: 3]

3 The diagram shows a vehicle that is designed to travel on snow.
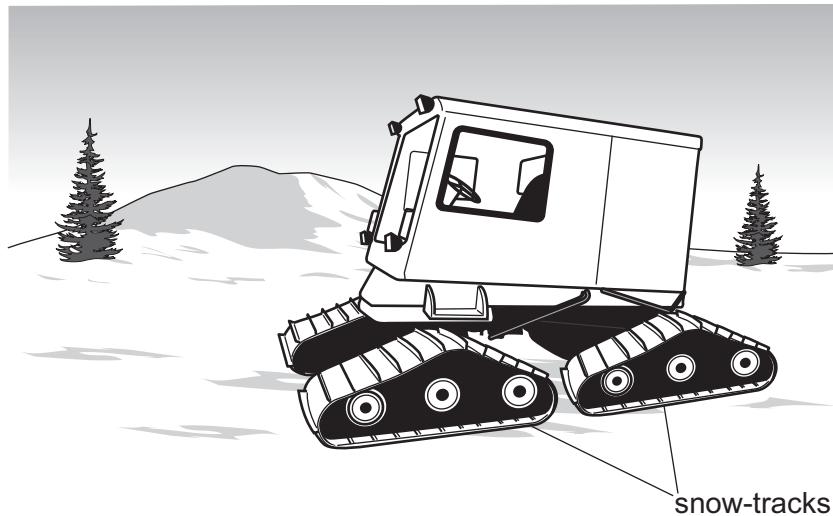
snow-tracks

The vehicle has four snow-tracks.

Explain why the snow-tracks are better than wheels for travelling on snow.

...

....

.... [2]

[Total: 2]

4 A metal block has a weight of 24 N. The area of this metal block in contact with the ground is 4.0 cm^2.

Calculate the pressure of this block on the ground.

pressure = ... N / cm^2 [3]

[Total: 3]

5 The diagram shows an archer pulling the string of a bow.
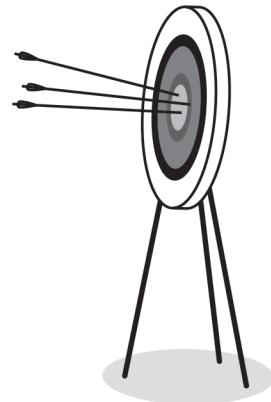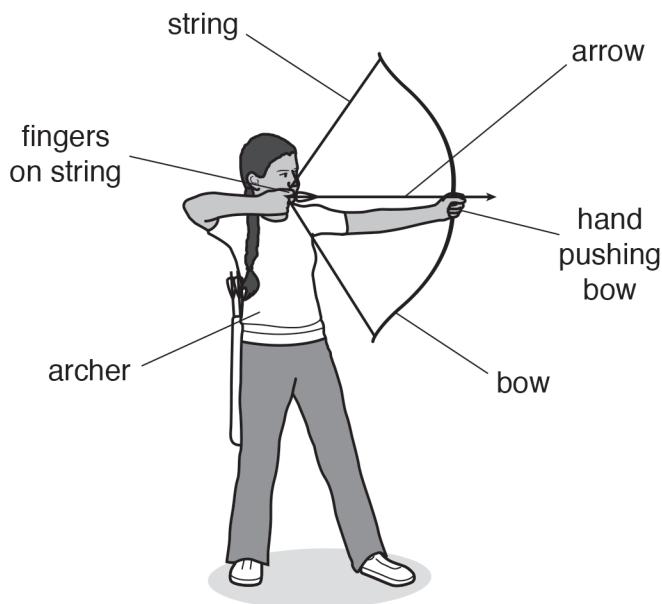
(a) The archer uses a force of 120 N. The force acts on an area of $0.5\,cm^2$ on the archer's fingers.

Calculate the pressure on the archer's fingers.

pressure on fingers = ...N/cm^2 [3]

(b) The archer's other hand is pushing the bow with the same force of 120 N. This force acts on a larger area than the force in **(a)**.

State whether the pressure on this hand is greater than, the same as or less than the pressure on the fingers holding the string.

....   [1]

[Total: 4]

6 The diagram shows a man pushing down on a lever to lift one end of a heavy log.

State the term used to describe the turning force exerted by the man.

.... [1]

[Total: 1]

7 Complete the statement by writing in the blank spaces.

The moment of a force about a pivot is equal to ....

multiplied by .... [1]

[Total: 1]

8 A sailor uses a winch to raise a sail on a boat. Diagram A shows the sailor turning the winch.
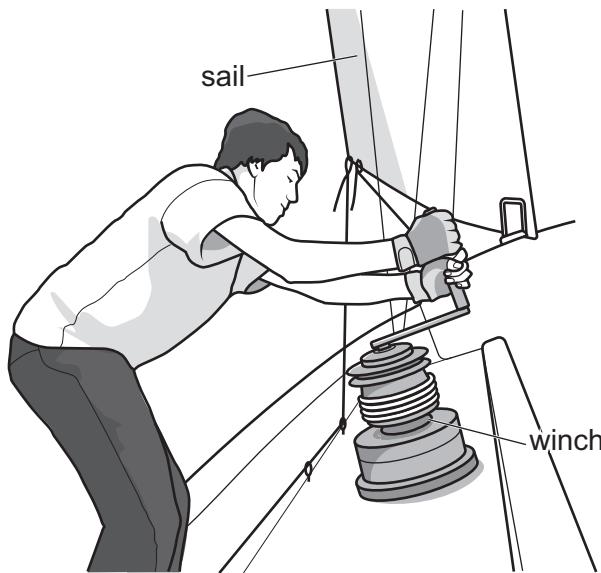
Diagram A

The sailor applies a force of 200 N at a distance of 30 cm from the pivot in the winch, as shown in diagram B.
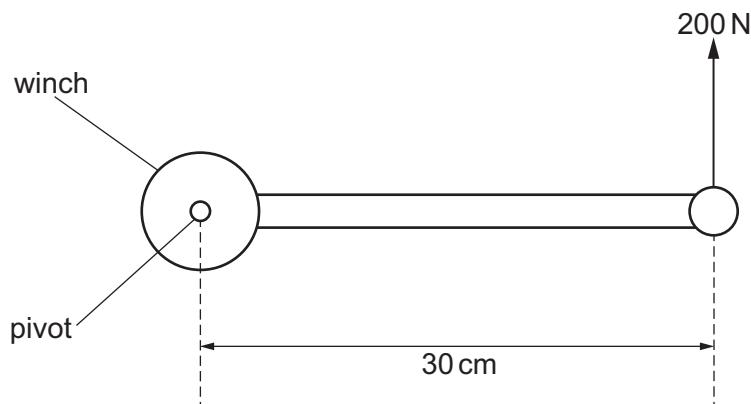
Diagram B

Calculate the moment of this force about the pivot.

moment of force = ... N cm   [3]

[Total: 3]

9 A student is doing some physical exercise. The diagram shows the student holding a 50 N weight.
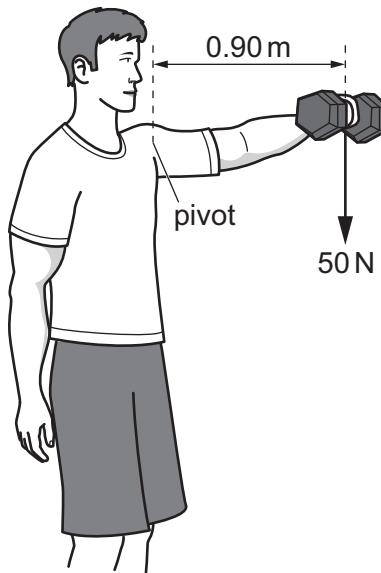
The pivot in the shoulder is 0.90 m from the centre of mass of the weight.

Calculate the moment of the weight about this pivot.

moment of the weight = ... N m   [3]

[Total: 3]

10 A 50 cm rule is balanced at its mid-point. A force of 8.0 N acts at a distance of 10 cm from one end of the rule.

The diagram shows the arrangement.
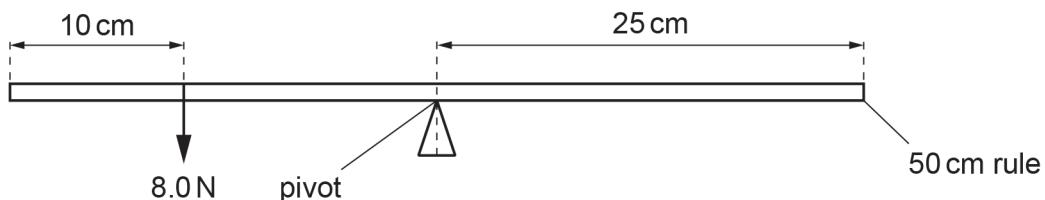
Calculate the moment of the 8.0 N force about the pivot. Give the unit.

moment = ...

unit = ...   [5]

[Total: 5]

11 A swimmer weighs 700 N. He stands on a diving board, as shown in the diagram.
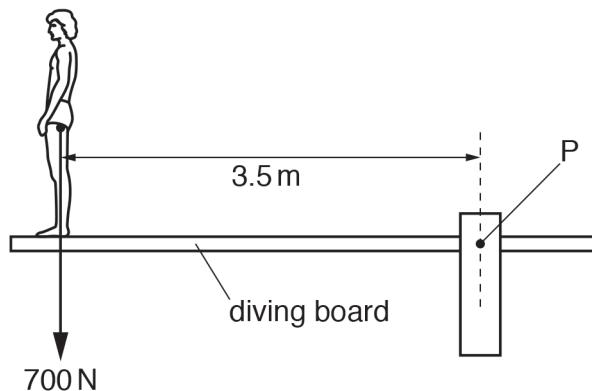
Calculate the moment of the swimmer's weight about point P.

moment = ... N m   [3]

[Total: 3]

12 A diver is swimming under water. She uses a torch emitting red light. The diagram shows three rays of red light coming from the torch.
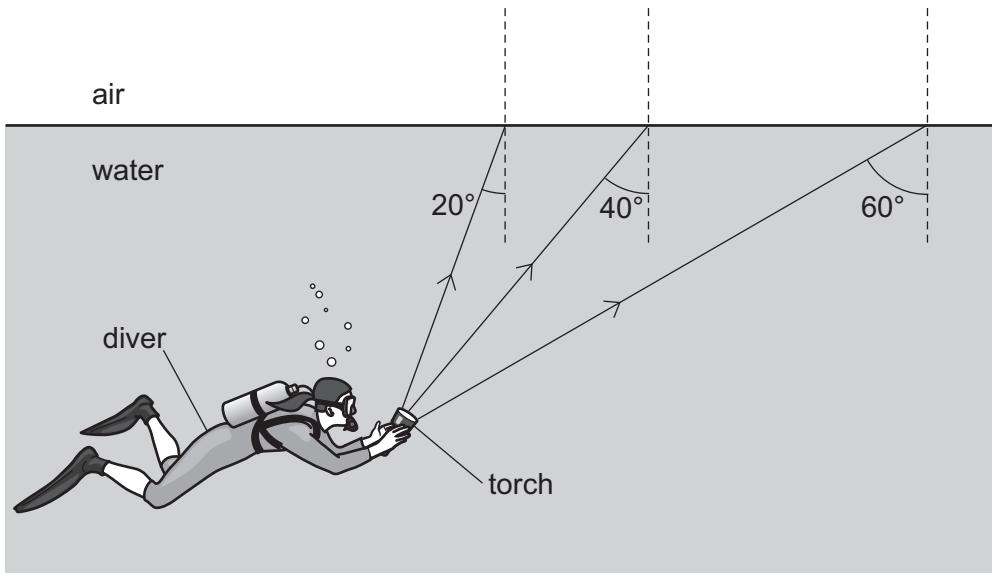

State the name of the dashed lines in the diagram.

.... [1]

[Total: 1]

13 The diagram shows a ray of light incident on a plane mirror at point X.

(not to scale)
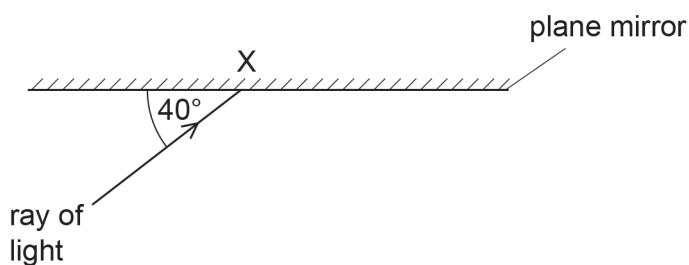
On the diagram:

• draw the normal at point X and label the normal with the letter N

• draw the ray reflected from point X. [2]

[Total: 2]

**14** The diagram shows light reflected by a plane mirror.
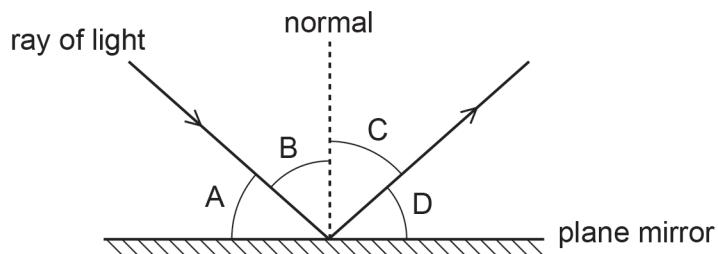
(a) State which angle, A, B, C or D, is the angle of incidence. .... [1]

(b) State which angle, A, B, C or D, is the angle of reflection. .... [1]

[Total: 2]

15 The diagram shows two rays of light X and Y leaving an object O. The rays strike a plane mirror. Ray X is reflected as shown.
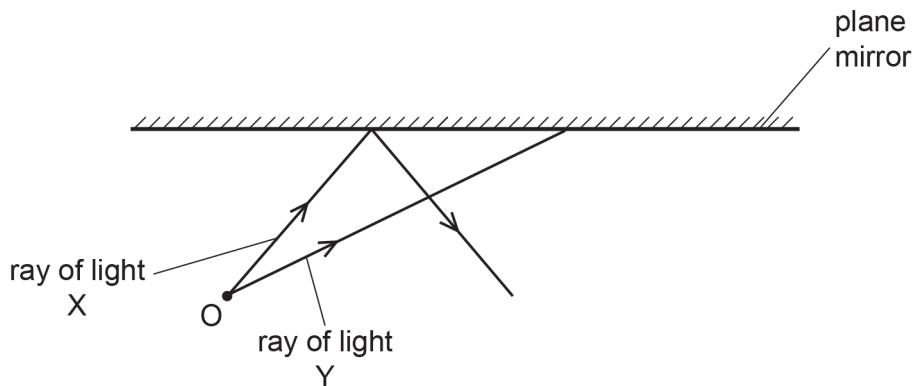

(a) On the diagram, draw the normal at the point where ray X strikes the mirror. [1]

(b) On the diagram, draw the path of ray Y after it strikes the mirror. [1]

[Total: 2]

16 The diagram shows a ray of light that is reflected by a mirror.
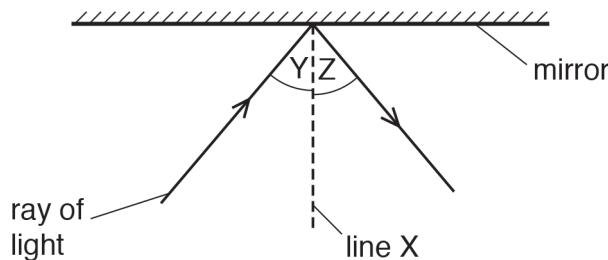
 (a) State the name of line X shown on the diagram.

 .... [1]

 (b) State the name of angle Y shown on the diagram.

 .... [1]

 (c) A student moves the ray of light and doubles the size of angle Y. State the effect on angle Z.

 .... [1]

[Total: 3]

17 A ray of white light is incident on a glass prism. It forms a spectrum that is visible on the screen. The diagram shows the arrangement.
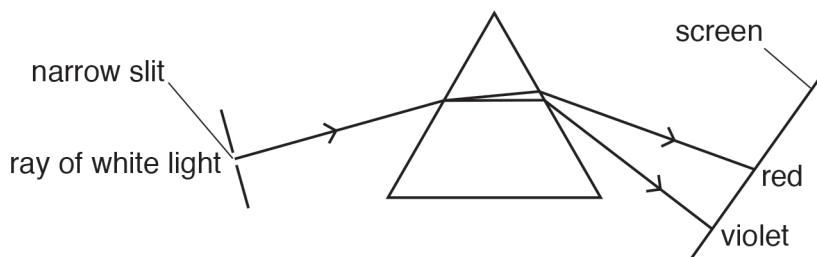
 Two of the colours in the visible spectrum are listed in the box below.

 Complete the box. List the five missing colours of the visible spectrum, in the correct order.

 | red | .... | .... | .... | .... | .... | violet |

[2]

18 Light passes into a glass block.

Which is the angle of refraction?

[1]

[Total: 1]