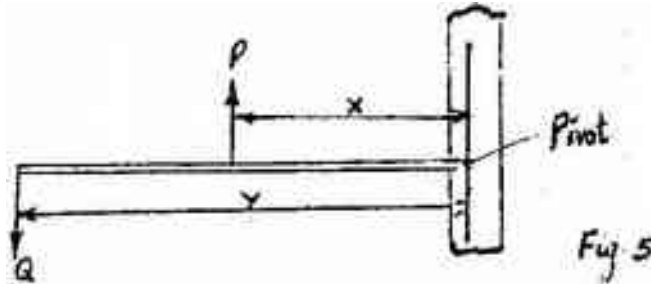


TURNING EFFECT OF A FORCE

1. 1995 Q17 P1

The diagram in figure 5 shows a beam negligible weight balanced by constant forces P and Q.



Derive the relationship between x and y (2 marks)

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2. 1996 Q14 P1

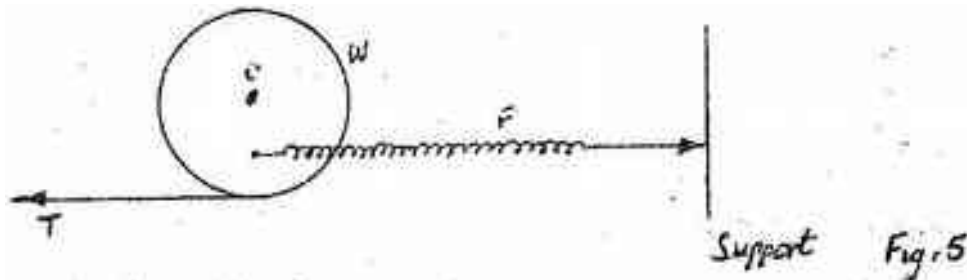


Figure 5 shows a wheel W pivoted at its centre, O and held stationary by a string and a spring. The tension in the strings is T and the force on the springs is F.

Use this information to answer 2 and 3

State how the magnitudes of T and F compare. Give reasons for your answer (3 marks)

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3. 1996 Q15 P1

State what would happen to the wheel if the string snapped (1 mark)

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4. 1996 Q30 P1

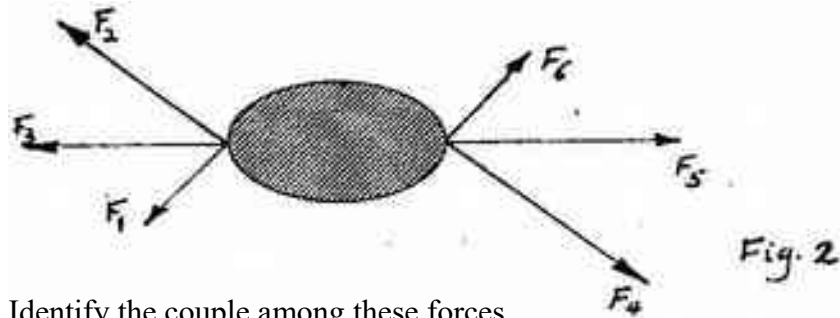
The moment of the weight of vertical door does not significantly affect the moment of the force required to open the door. Give a reason for this (1 mark)

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5. 1997 Q2 P1

Figure 2 shows a rigid body acted upon by a set of forces. The magnitudes of the forces are as follow

$F_1 = 3\text{N}$, $F_2 = 6\text{N}$, $F_3 = 3\text{N}$, $F_4 = 4\text{N}$, $F_5 = 3\text{N}$ and $F_6 = 3\text{N}$



Identify the couple among these forces

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6. 1998 Q24 P1

John carried a uniform post of mass 20kg horizontally on his shoulder as shown in fig 6. He placed the post on his shoulder such that the centre of gravity of the pole is 1.0m behind him. He balanced the post by applying a downward force F at a point 0.5m on the part of the post in front of him.

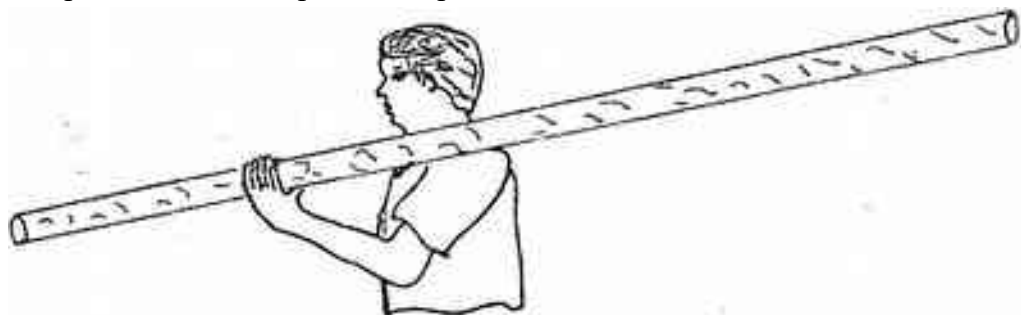


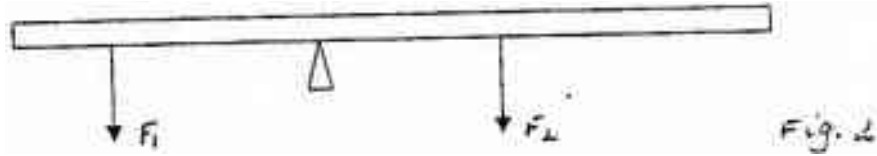
Fig 6

Determine the value of the force F .

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7. 1999 Q2 P1

Figure 2 shows forces F_1 and F_2 acting on a meter rule such that it is in equilibrium.



Mark on the figure a third force F_3 acting on the rule such that it is in equilibrium maintained.

8. 1999 Q14 P1

Determine the moment of the couple shown in figure 10.



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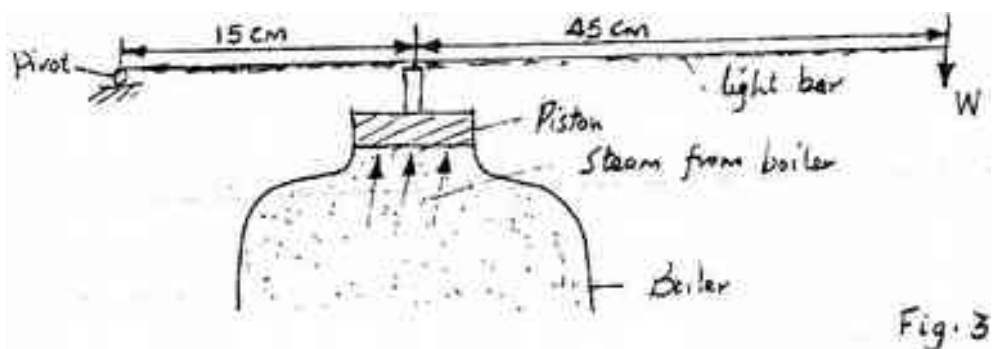
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9. 2000 Q5 P1

Fig. 3 shows a device for closing a steam outlet.



The area of the piston is $4.0 \times 10^{-4} \text{ m}^2$ and the pressure of the steam in the boiler is $2.0 \times 10^5 \text{ Nm}^{-2}$. Determine the weight W that will just hold the bar in the horizontal position shown.

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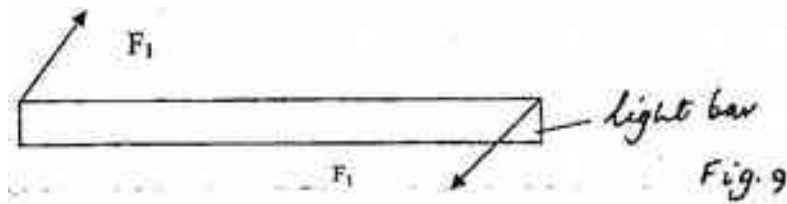
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10. 2000 Q14 P1

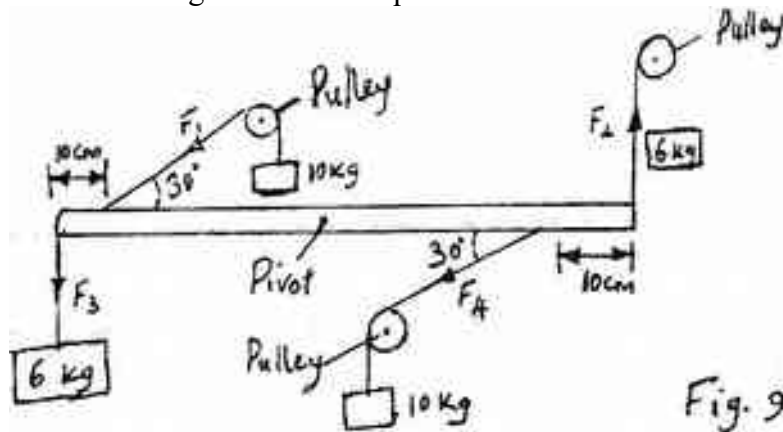
In fig 9 the couple represented by forces F_1 is acting on light uniform bar.



Sketch on the figure a couple represented by forces F_2 such that the bar is in equilibrium. And the forces F_2 have minimum magnitude.

11. 2001 Q12 P1

Fig. 9 shows a uniform light bar one meter in length in equilibrium under the action of forces F_1 , F_2 , F_3 and F_4 . All the forces are in the same plane. Use the information on the figure to answer questions 11 and 12.



Name one set of forces on the figure that constitutes a couple.

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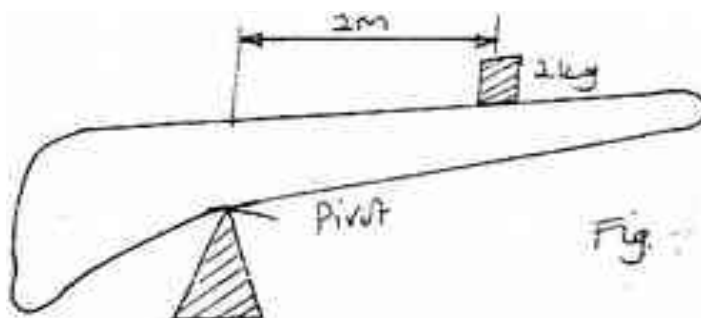
12. 2001 Q13 P1

Determine the moment of the couple named in question 11.

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13. 2002 Q12 P1

Fig. 7 shows a non – uniform log of mass 100kg balanced on the pivot by a 2kg mass placed as shown.



Determine the distance of the centre of gravity of the log from the pivot.

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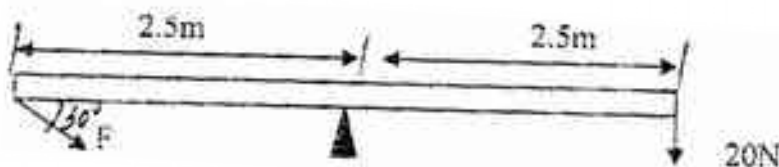
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14. 2003 Q14 P1

Figure 9 shows a uniform bar in equilibrium under the action of two forces.



Determine the value of F

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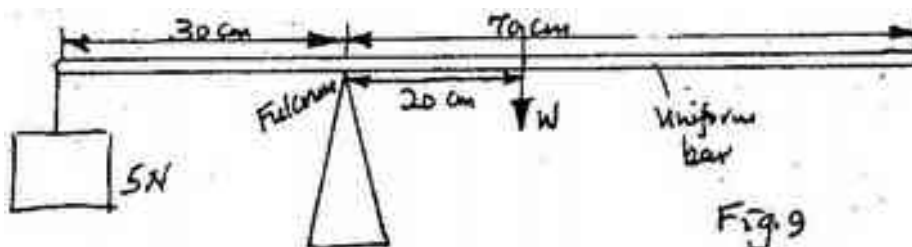
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15. 2004 Q14 P1

The system in figure 9 is in equilibrium.



Determine the weight of the bar.

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16. 2007 Q8 P1

Figure 5 shows a uniform bar of length 1.0 m pivoted near one end. The bar is kept in equilibrium by a spring balance as shown.

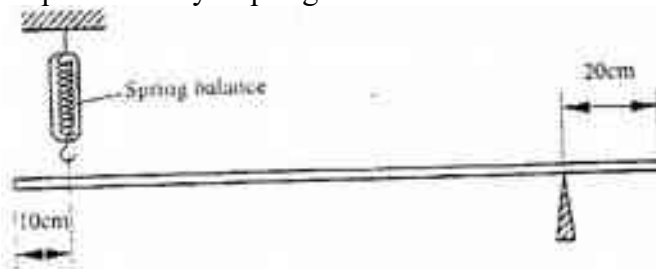


Figure 5

Given that the reading of the spring balance is 0.6 N. Determine the weight of the bar. (3 marks)

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17. 2008 Q19 P1

a) State the principle of moments. (1mark)

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b) A uniform metal strip is 3.0cm wide, 0.6cm thick d 100cm long. The density of the metal is 2.7 g/cm³.

(i) Determine the weight of the strip. (3marks)

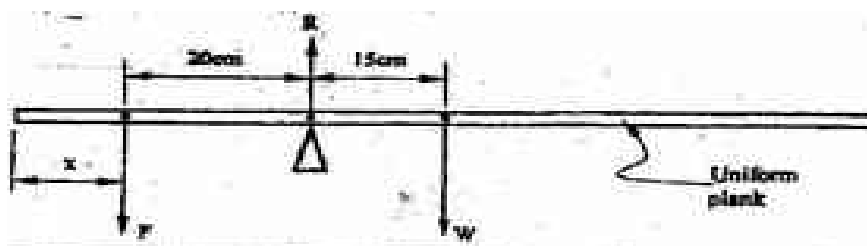
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The strip placed on a pivot and kept in equilibrium by forces as shown in fig. 13

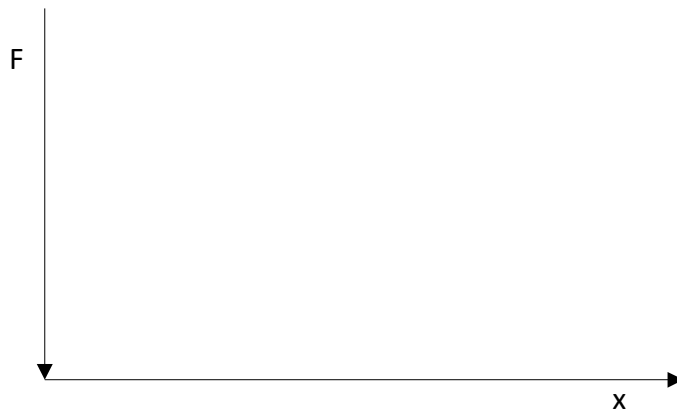


(ii) Determine the value of F and R

(3 marks)

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(iii) X is the distance from the end of the plank to the point of application of force F. Force F is now applied at various points nearer to the pivot so that x increases. Equilibrium is maintained all the time. On the axes provided sketch the relation between force F and x.



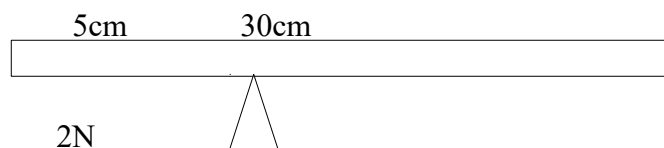
(iv) Give a reason for the answer in (iii) above

(1 mark)

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18. 2010 Q6 P1

Figure 3 shows a uniform meter rule pivoted at 30cm mark. It is balanced by weight of 2N suspended at the 5cm mark.

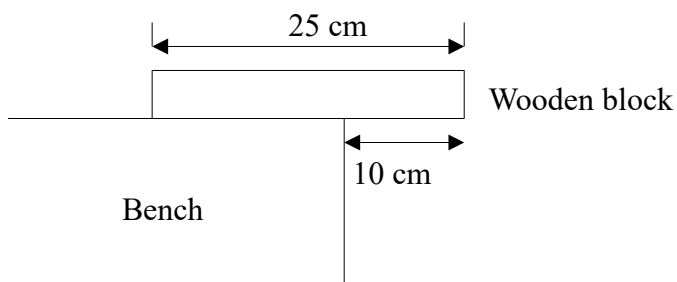


Determine the weight of the metre rule.

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19. 2011 Q11 P1

Figure 8 shows a uniform wooden block of mass 2kg and length 25cm lying on a bench. It hangs over the edge of the bench by 10cm. Use the figure to answer questions 19 and 20.



Indicate on the figure two forces acting on the wooden block. (1 mark)

20. 2011 Q12 P1

Determine the minimum force that can be applied on the wooden block to make it turn about the edge of the bench. (2 marks)

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