

**PRESSURE**

1. (a) (i) ✓ 100 *accept '200 , 2.0'* 1 (L7)  
 ✓ N/cm<sup>2</sup> 1 (L7)  
*accept '10<sup>6</sup> N/m<sup>2</sup>' or '10<sup>6</sup> Pa' for two marks*
- (ii) 800 *accept '100 × 8'* 1 (L7)  
*accept the numerical answer to a i × 8*  
*the unit is not required for the mark*
- (b) (i) any **one** from 1 (L6)  
 ✓ air **or** gas can be compressed *accept 'gases are easier to compress'*  
*'air or gas provides less resistance' is insufficient*  
 ✓ water **or** liquids cannot be compressed  
 ✓ gaps between particles of air **or** gas can be reduced *accept 'atoms can be compressed together'*
- (ii) any **one** from 1 (L7)  
 ✓ less force would be transmitted to the brakes *accept 'the brakes have less effect'*  
*'the brakes are spongy' is insufficient*  
 ✓ less pressure at B *accept 'less pressure could be produced'*  
*accept 'less or no resistance to the brakes'*  
 ✓ piston B would not move *accept 'the air bubbles could be compressed'*
2. (a) (i) ice skate *accept 'skate'* 1 (L3)  
 (ii) Tom's weight on the footwear ✓ 1 (L3)  
*if more than one box is ticked, award no mark*
- (b) any **one** from 1 (L3)  
 ✓ they do not sink in  
 ✓ they have a big surface *accept 'they are wide' or 'they are big'*  
*accept 'they spread out your weight'*  
*do not accept 'you won't get your feet stuck in the snow'*  
*accept 'they reduce the pressure'*

[5]

*do **not** accept 'they spread out your pressure'*

	(c)	friction		1 (L4)		
						<b>[4]</b>
<b>3.</b>	(a)	25	<i>accept '175 , 7'</i>	1 (L7)		
	(b)	any <b>one</b> from				
		✓ greater than 27 N/cm <sup>2</sup>	<i>the unit is required for the mark do <b>not</b> accept '27 N/cm<sup>2</sup>'</i>	1 (L7)		
		✓ greater than the pressure in the tyre	<i>accept any answer greater than 27 N/cm<sup>2</sup></i>			
	(c)	2850		1 (L7)		<b>[3]</b>
<b>4.</b>	(a)	(i)	450		1	
			Ncm	<i>accept 'cmN'</i>	1	
				<i>accept '4.5 N m' for <b>both</b> marks</i>		
		(ii)	300	<i>the unit is not required for the mark consequential marking applies accept the numerical answer to (a) (i) ÷ 1.5 cm</i>	1	
	(b)	(i)	400 000 N/cm <sup>2</sup>	<i>accept '40 N/m<sup>2</sup>' or '40 Pa' for <b>both</b> marks</i>	1 1	
		(ii)	because the area of contact will increase		1	<b>[6]</b>
<b>5.</b>	(a)	(i)	40 N/cm <sup>2</sup>	<i>the unit is required for the mark accept '400 000 Pa'</i>	1	
		(ii)	200 N	<i>the unit of force is required for the mark consequential marking applies accept numerical answer to (a)(i) × 5 cm<sup>2</sup></i>	1	

	(b)	(i)	200 N	<i>the unit is required for the mark</i>	1
		(ii)	1600 N	<i>the unit of force is required for the mark consequential marking applies</i>	1
				<i>accept numerical answer to (b) (i) × 8</i>	
					<b>[4]</b>
<b>6.</b>	(a)		150		1
	(b)		there is nothing to balance the force of the string	<i>accept 'it is pushed by the string' accept 'there is a forward force acting on it' accept 'potential energy is converted to kinetic energy' or 'energy from the bow is transferred to the arrow'</i>	1
	(c)		any <b>one</b> from		1
			∨ because they are not in opposite directions	<i>accept 'because they are in different directions' or 'because they are at an angle to each other' or 'because they are not both horizontal'</i>	
				<i>do <b>not</b> accept 'because they are at an angle'</i>	
			∨ because they do not act along the same line	<i>accept 'gravity pulls down and friction pushes across'</i>	
	(d)		any <b>one</b> from		1
			∨ because the force is concentrated in a much smaller area	<i>accept 'because the area in contact is smaller'</i>	
				<i>or 'because there is a smaller area'</i>	
			∨ because pressure is force divided by area		
					<b>[4]</b>
<b>7.</b>	(a)	(i)	they get closer <b>or</b> it gets less		1
		(ii)	nothing <b>or</b> same distance		1
		(iii)	it increases		1
		(iv)	it decreases		1
	(b)		water flows into the cap	<i>accept 'water flows <b>or</b> is pushed'</i>	1

*or got into the cap'*  
*or 'the air in the cap takes up less space'*  
*accept 'the air in the cap is under pressure'*

any **one** from

1

- ✓ increasing the density
- ✓ less upthrust
- ✓ pen cap now less buoyant

*accept 'increasing the weight'*

*do **not** accept 'the pen cap gets heavier'*

[6]