

PRESSURE

1. (a) (i) • 100 *accept '200 ÷ 2.0'* 1 (L7)
 • N/cm² 1 (L7)
accept '10⁶ N/m²' or '10⁶ 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'
do not accept 'they spread out your pressure'

[5]

	(c)	friction		1 (L4)	[4]
3.	(a)	25	<i>accept '175 ÷ 7'</i>	1 (L7)	
	(b)	any one from			
		• greater than 27 N/cm ²	<i>the unit is required for the mark do not accept '27 N/cm²'</i>	1 (L7)	
		• greater than the pressure in the tyre	<i>accept any answer greater than 27 N/cm²</i>		
	(c)	2850		1 (L7)	[3]
4.	(a)	(i)	450	1	
			Ncm	<i>accept 'cmN'</i>	1
				<i>accept '4.5 N m' for both 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	<i>accept '40 N/m²' or '40 Pa' for both marks</i>	1
			N/cm ²		1
		(ii)	because the area of contact will increase		1
					[6]
5.	(a)	(i)	40 N/cm ²	<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 cm²</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 accept numerical answer to (b) (i) $\times 8$</i>	1
[4]				
6.	(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 one from		1
		<ul style="list-style-type: none"> 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' do not accept 'because they are at an angle'</i>	
		<ul style="list-style-type: none"> because they do not act along the same line 	<i>accept 'gravity pulls down and friction pushes across'</i>	
	(d)	any one from		1
		<ul style="list-style-type: none"> because the force is concentrated in a much smaller area 	<i>accept 'because the area in contact is smaller' or 'because there is a smaller area'</i>	
		<ul style="list-style-type: none"> because pressure is force divided by area 		
	[4]			
7.	(a)	(i)	they get closer or it gets less	1
		(ii)	nothing or same distance	1
		(iii)	it increases	1
		(iv)	it decreases	1
	(b)	water flows into the cap	<i>accept 'water flows or is pushed or got into the cap' or 'the air in the cap takes up less space' accept 'the air in the cap is under pressure'</i>	1

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]