PRESSURE

1. (a) (i) • 100
   • N/cm²
   accept ’200 ÷ 2.0’ 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
   • 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
   • 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 ✓
    if more than one box is ticked, award no mark
(b) any one from
   • they do not sink in
     accept ’they are wide’ or ’they are big’
     accept ’they spread out your weight’
   • they have a big surface
     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’
(c) friction 1 (L4) [4]

3. (a) 25 accept ‘175 ÷ 7’ 1 (L7)
(b) any one from
   • greater than 27 N/cm² the unit is required for the mark 1 (L7)
do not accept ‘27 N/cm²’
   • greater than the pressure in the tyre accept any answer greater than 27 N/cm²
(c) 2850 1 (L7) [3]

4. (a) (i) 450 N cm accept ‘cmN’ 1
         accept ‘4.5 N m’ for both marks 1
(ii) 300 the unit is not required for the mark 1
         consequential marking applies accept the numerical answer to
         (a) (i) ÷ 1.5 cm

(b) (i) 400 000 accept ‘40 N/m²’ or ‘40 Pa’ for both marks 1
         N/cm² 1
(ii) because the area of contact will increase 1 [6]

5. (a) (i) 40 N/cm² the unit is required for the mark 1
         accept ‘400 000 Pa’
(ii) 200 N the unit of force is required for the mark 1
         consequential marking applies accept numerical answer to (a)(i) × 5 cm²
(b) (i) 200 N  
the unit is required for the mark 1
(ii) 1600 N  
the unit of force is required for the mark consequential marking applies accept numerical answer to (b) (i) \times 8 [4]

6. (a) 150 1
(b) there is nothing to balance the force of the string 1 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’
(c) any one from 1
• because they are not in opposite directions 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’
• because they do not act along the same line accept ‘gravity pulls down and friction pushes across’
(d) any one from 1
• because the force is concentrated in a much smaller area accept ‘because the area in contact is smaller’ or ‘because there is a smaller area’
• 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 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’
any one from

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

accept ‘increasing the weight’

do not accept ‘the pen cap gets heavier’