PRESSURE

1. (a) (i) • 100   *accept '200 ÷ 2.0'*   1 (L7)

             • N/cm^2 1 (L7)

                        *accept '$10^6 N/m^2$' **or** '10^6 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   *accept 'gases are easier to compress'*
               compressed   *'air **or** gas provides less resistance' is*
                               insufficient

            • water **or** liquids cannot be
               compressed

            • gaps between particles of   *accept 'atoms can be compressed together'*
               air **or** gas can be reduced

       (ii) any **one** from   1 (L7)

            • less force would be   *accept 'the brakes have less effect'*
               transmitted to the brakes   *'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'

                                                          [5]

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'

(c)   friction   1 (L4)

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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   1

                       Ncm   *accept 'cmN'*   1
                                                  *accept '4.5 N m' for **both** marks*

                (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* 1
                                                  mark 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*	1
			accept numerical answer to (b) (i) × 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*   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]