ASM TUITION ACADEMY

PHYSICS

YEAR 8

TOPIC: Contact Force, Area and Pressure

TEST QUESTIONS

TOTAL MARKS: 55

TIME: 45 MINUTES

SECTION A: MULTIPLE-CHOICE QUESTIONS

Q1–Q10: Choose the correct answer. [10 marks]

Q1. What is pressure?

A. Force multiplied by area
B. Force divided by area
C. Area divided by force
D. Mass multiplied by area

Q2. Which formula is used to calculate pressure?

A. Pressure = force × area
B. Pressure = area ÷ force
C. Pressure = force ÷ area
D. Pressure = force + area

Q3. What is the SI unit of pressure?

A. Newton (N)
B. Metre (m)
C. Kilogram (kg)
D. Newton per square metre (N/m^2)

Q4. A man exerts a force of 600 N on the ground. What is his contact force on the ground?

A. 60 N
B. 600 N
C. 6,000 N
D. 0 N

Q5. How is the area of a rectangle calculated?

A. Length + width
B. Length ÷ width

C. Length × width
D. Length − width

Q6. What is the area of a rectangle with a length of 0.25 m and a width of 0.10 m?

A. 0.35 m^2
B. 0.025 m^2
C. 2.5 m^2
D. 0.25 m^2

Q7. Why does a man wearing a snowboard sink less into snow?

A. His weight disappears
B. His contact force becomes zero
C. His contact area increases, reducing pressure
D. The snow becomes harder

Q8. If the same force acts over a larger area, what happens to the pressure?

A. It increases
B. It decreases
C. It stays the same
D. It becomes zero

Q9. A force of 100 N acts over an area of 2 m^2. What is the pressure?

A. 50 N/m^2
B. 200 N/m^2
C. 102 N/m^2
D. 98 N/m^2

Q10. Why do skis help a person move over snow more easily?

A. They increase the person's weight
B. They reduce the contact area
C. They spread the force over a larger area
D. They increase the pressure on the snow

SECTION B: FILL IN THE BLANKS

Q11–Q20: Complete each sentence. [10 marks]

Q11. Pressure is calculated by dividing force by _____.

Q12. The contact force exerted by the man on the ground is _____ N.

Q13. The area of a rectangle is calculated by multiplying its length by its _____.

Q14. The unit of pressure is newton per _____ metre.

Q15. Pressure is represented by the formula: pressure = force ÷ _____.

Q16. The contact area of one footprint is _____ m^2.

Q17. The total contact area of two footprints is _____ m^2.

Q18. If the contact area increases while the force remains constant, pressure _____.

Q19. A larger contact area spreads the force over a larger _____.

Q20. Pressure is measured in _____ per square metre.

SECTION C: SHORT-ANSWER QUESTIONS

Q21–Q29: Answer all questions. [35 marks]

Q21. Define pressure and state its formula and unit. **[3 marks]**

Q22. Explain why a man wearing boots sinks deeper into snow than a man using a snowboard. **[4 marks]**

Q23. A footprint has a length of 0.25 m and a width of 0.10 m. Calculate its area. Show your working. **[4 marks]**

Q24. A man weighs 600 N. Each footprint has an area of 0.025 m^2. Calculate the total contact area of both footprints and the pressure exerted on the snow. Show your working. **[4 marks]**

Q25. Explain what happens to pressure when the same contact force acts over a larger area. **[4 marks]**

Q26. A box exerts a force of 200 N on the floor over an area of 0.5 m². Calculate the pressure exerted by the box. Show your working. **[4 marks]**

Q27. A force of 400 N produces a pressure of 2,000 N/m². Calculate the contact area. Show your working. **[4 marks]**

Q28. Two people exert the same force on snow. Person A has a contact area of 0.2 m², while Person B has a contact area of 0.8 m². Calculate the pressure exerted by each person if the force is 400 N. **[4 marks]**

Q29. Explain why spreading a force over a larger area helps prevent an object from sinking deeply into a soft surface. **[4 marks]**