Contents

Percentages (Profit and Loss)
HCF and Comparison with LCM
Exercise questions, Questions on concepts covered
Questions from 11-pls past papers

G Rayapati

A. Percentages (Profit and Loss)

Summary:

- **Profit:** When the selling price is higher than the original price**.**

  Profit **=** selling price - cost price

- **Loss:** When the selling price is lower than the cost price.

  Loss **=** cost price - selling price

- **Percentage Profit:** Profit Percentage = (Profit / Cost Price) × 100
- **Percentage Loss:** Loss Percentage = (Loss / Cost Price) × 100

Key Words: profit, loss, percentage increase, percentage decrease, percentage discount, selling price, cost price, percentage off

Examples:

1. **Lucy bought a bicycle for £50 and sold it for £60. How much percentage profit did she make?**

   Step-by-Step Solution:

   1. Find the Profit:
      The profit is the difference between the Selling Price and the Cost Price.
      Profit=Selling Price−Cost Price
      Profit=60−50=10 pounds

   2. Calculate the Percentage Profit:
      The formula for percentage profit is:
      Percentage Profit = (Profit / Cost Price) × 100
      Percentage Profit = (10 / 50) × 100 = 0.2×100=20%

   So, Lucy made a 20% profit on the bicycle.

2. **Oliver bought a video game for £24 and sold it for £18. How much percentage loss did you make?**

Step-by-Step Solution:

3. Find the Loss:
   The loss is the difference between the Cost Price and the Selling Price.
   Loss = Cost Price - Selling Price
   Loss = 24−18=6 pounds
4. Calculate the Percentage Loss:
   The formula for percentage loss is:
   Percentage Loss = (Loss / Cost Price) × 100
   Percentage Loss = (6 / 24) × 100 = 0.25×100=25%

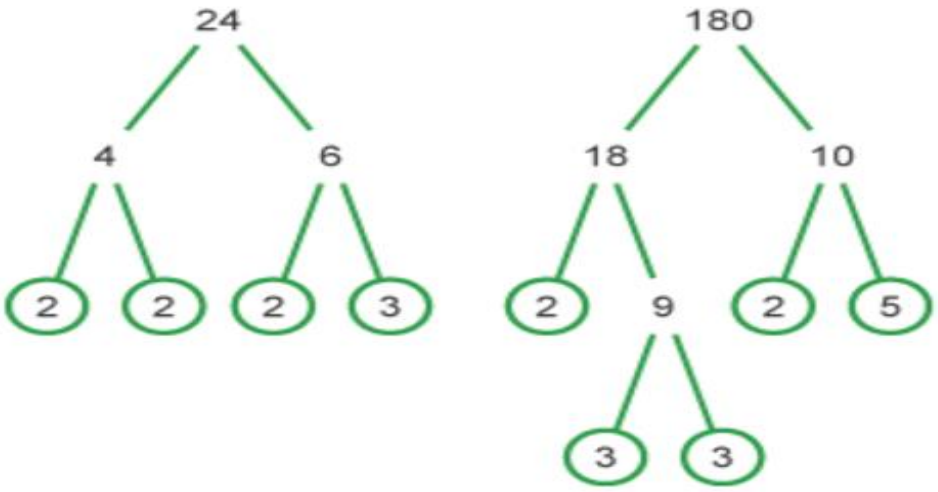
So, Oliver made a 25% loss on the video game.

B. Highest common factor (HCF)

- The highest common factor (HCF) or greatest common factor (GCF) is the largest integer that two or more numbers can be divided by.
- There are several interchangeable terms like GCF represents the greatest common factor, and GCD represents the greatest common divisor. These are all the same.

Example: Find the HCF and LCM of 24 and 180 using prime factors tree.

Write 24 and 180 as the product of their prime factors.



Find any prime factors that are in common between the products.
The product of prime factors for 24 is: 2 × 2 × 2 × 3
The product of prime factors for 180 is: 2 × 2 × 3 × 3 × 5
HCF = 2 x 2 x 3 =12

Note: **The HCF of two prime numbers is always 1, because they only have 1 as their common factor.**

Key Words: common factor, greatest, maximum, largest, most, biggest, dividing equally, distributing equally, identical groups, same number of groups, and largest possible number of groups.

C. Lowest common multiple (LCM)

- The Least Common Multiple (LCM) is also referred to as the Lowest Common Multiple (LCM) and Least Common Divisor (LCD)
- The LCM of two or more numbers is the smallest number that is evenly divisible by all numbers in the set
- For e.g. LCM (2,3) = 6 so here 6 (LCM) is the smallest positive integer that is evenly divisible by both 2 and 3

Key Words: least, minimum, next time, repeat, occur again, meet again, both at the same time, cycle, first time together, and smallest common multiple

Example: LCM (10, 18, 25) = 2 × 3 × 3 × 5 × 5 = 450

2	10	18	25
3	5	9	25
3	5	3	25
5	5	1	25
5	1	1	5
	1	1	1

D. Exercise questions:

1. Amy buys a bicycle for £285 and sold it for £320. What is her percentage profit?

2. A trader buys a watch for £80 and marks it up by 25%. How much does he sell the watch for, and what is his percentage profit?

3. A shopkeeper buys 10 phones at £225 each and sells them at £270 each. What is the percentage profit for all the phones?

4. A trader bought a television for £240 and sold it at 20% profit. What was the selling price of the television?

5. Mr. Bennet bought a computer for £400. He gave a 10% discount on the marked price and sold it for £380. What is the percentage profit or loss he made?

6. A pair of football boots cost £75 full price. They are reduced by 30%. What is the reduced price?

7. The table below shows the price of a jacket in five shops and their discounts in the sale. Find the shop that offers the best deal.

Shop	Original price	discount	Sale price	Money saved
A	*£58*	30%		
B	£38	Reduced by 1/4		
C	£75	1/3 off		
D	£129	2/3 off		
E	**£180**		**£145**	

8. The percentage increase 24 by 12 ½%

9. The percentage decrease 48 by 33 ¼%

10. The percentage decreased £245 by 28%

11. Find the highest common factor (HCF) of 9 and 21

12. Find the highest common factor (HCF) of 12 and 90

13. Find the highest common factor (HCF) of 30, 36 and 76

14. Two off cut lengths of ribbon measure 1.2 m and 80 cm. Each piece of ribbon needs to be cut into the fewest number of pieces the same length. What is the length of each piece?

15. A machine goes "pop" every 20 minutes and "beep" every 35 minutes." It goes "pop" and "beep" together at 12pm. When will the machine next go "pop" and "beep" together?

E. Revision questions:

16. What is the value of the underlined digit in the below numbers

a) 14<u>1</u>0 =

b) 1<u>0</u>5528 =

c) 15.7<u>8</u> =

d) 2.<u>0</u>8 =

17. Answer the following questions (s.f = significant figures, d.p = decimal point)

Number	Round to 3 s.f	Round to 1 s.f	Round to nearest integer	Round to nearest whole number	Round to 2 d.p
0.6594					
304.03					
39.057					

18. √25 = √100 = √27 =

19. Write 680 as a product of its prime factors in index form.

20. Lighthouse A flashes every 8 sec. Lighthouse B flashes every 12 sec. If they start flashing at the same time, how long will it be until they next flash together?

21. Identify the missing number in the below pattern

i) 10, 20, 40, ____, 160 ii) 1, 3, 6, 10, _____, 21, 28

22. $4^3 + 6 \times (5 - 2) \div 3 - 3^2 =$

23. 3.106 – 0.6073 =

24. Divide 0.895 by 0.13 = and 0.58 x (9.3 – 8.72) =

25. 0.002 x 100 = and 0.478 ÷ (38.75 x 0.8) =

26. 0.416 ÷ 4 = and 8435 ÷ 0.7 =

27. 0.001 x 100 = and 1.0101 x 1000 =

F. Questions from past papers on covered topics:

28. Matthew's temperature is 37.5°C. and when he was ill it rose 3°C. What was his temperature when he was ill?

29. Put these fractions in order of size, starting with the largest first. ¾, 5/8, ½, 7/8, ¼

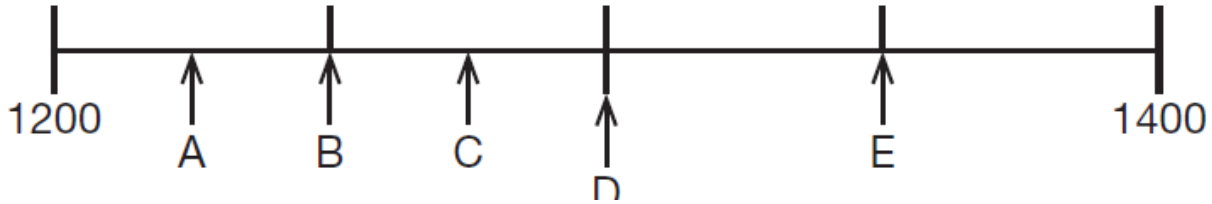
30. Ava had 5 boxes. Each box weighed 800 grams. How many KILOGRAMS was this altogether?

31. What is 60% of 50?

32. HCF (5, 7) = HCF(27, 59) =

33. Work out XXVI multiplied by XLI.

34. Which letter is pointing at 1250?



35. Put the correct number in the blank. 27 x 99 = 2700 - ☐

36. Ali and his sister share a pizza cut into six equal pieces. Ali eats 1/3 of all the pieces. His sister eats 1/4 of the remaining pieces. After both Ali and his sister have eaten, what fraction of the pizza is left?

37.

 stands for 12 ships.

Look at this table.

Dock	Number of Ships
A	
B	
C	

How many more ships are in dock A than dock C?

A 0.5 B 1 C 3 D 4 E 6

38. A boy delivered newspapers. He was paid £1.40 for every 100 papers he delivered. How much was he paid for delivering 250 papers?

39. A bag had 1045 sweets in it. Ethan took out 2 / 3 of them. How many sweets did he take out?

40. Write the list of rectangular numbers less than 50.