Attempt all questions and for those problems where solutions are provided, only look at the solutions after you have tried to solve them yourself.

1. Given the list of numbers 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 19, 21, 22, 24, 48 answer question 1 to 5
   a) How many prime numbers are there in the list?
   b) Write down all the prime numbers?
   c) List down all the factors of 48 from the list
   d) How many rational numbers are there in the list?
   e) Write down all the composite numbers
2. Decompose 720 into a product of its prime factors
3. Find the LCM and the HCF of 90, 15 and 40
4. Boxes that are 12 cm tall are being stacked to boxes that are 18 cm tall. What is the shortest height at which the two stacks will be the same height?
5. There are 40 girls and 32 boys who want to participate in 7th grade intramurals. If each team must have the same number of girls and the same number of boys, (i) what is the greatest number of teams that can participate in intramurals? (ii) How many girls are in each team and how many boys are in each team?
6. Frieda earns a salary every month. She spends NS$3400, which is $\frac{2}{5}$ on accommodation and NS$1700 on food. What fraction of her salary is left for other purposes?
7. Simplify the expression $\frac{8.43 \times 10^{-2}}{0.45 \times 10^5}$ and leave the answer correct to (3.s.f):

8. Evaluate the following without using a calculator
   (a) $-3^2 + \left[20 \div (7 - 11)\right] \times 5 + 27\frac{2}{3}$

   Solution:
   $= -3^2 + 2[20 \div (-4)] \times 5 + 27\frac{2}{3}$
   $= -3^2 + 2[-5] \times 5 + 27\frac{2}{3}$
   $= -3^2 + 2[-5] \times 5 + (3\frac{1}{3})\frac{2}{3}$
   $= -9 + 2[-5] \times 5 + 9$
\[= -9 - 50 + 9\]
\[= -50\]

b) \[\frac{1}{4}[2 \times 3 + 5 \times 4) - (3 \times 2 - 2 \times 4)]\]

Solution:
\[= \frac{1}{4}[(6 + 20) - (6 - 8)]\]
\[= \frac{1}{4}[26 - (-2)]\]
\[= \frac{1}{4}[26 + 2]\]
\[= \frac{1}{4}[26 + 2]\]
\[= \frac{1}{4}[28]\]
\[= 7\]

c) \[[3(7 - 2 \times 4) + 9] \times [6 - (5 + 3)]\]

d) \[\frac{1}{5} \div \frac{2}{5} \left(\frac{1}{2} - \frac{1}{4}\right) - 2 \frac{2}{3} \div \left(-\frac{2}{3}\right) \times \left(-\frac{1}{2}\right)\]

Solution:
\[\frac{1}{5} \div \frac{2}{5} \left(\frac{1}{2} - \frac{1}{4}\right) - 2 \frac{2}{3} \div \left(-\frac{2}{3}\right) \times \left(-\frac{1}{2}\right)\]
\[= \frac{1}{5} \div \frac{2}{5} \left(\frac{1}{4}\right) - \frac{8}{3} \left(-\frac{2}{3}\right) \times \left(-\frac{1}{2}\right)\]
\[= \frac{1}{5} \div \frac{2}{5} \cdot \frac{1}{4} - \frac{8}{3} \times \left(-\frac{3}{2}\right) \times \left(-\frac{1}{2}\right)\]
\[= \frac{1}{5} \times \frac{20}{2} - \frac{8}{3} \times \left(-\frac{3}{2}\right) \times \left(-\frac{1}{2}\right)\]
\[= 2 - 2\]
\[= 0\]

9. A T-shirt costs N$ 125.00 before VAT is added on it. A customer pays N$175.50, VAT inclusive for the T-shirt. What percentage VAT has been added to the jacket’s price?

10. Simplify each of the following expressions without using a calculator

a) \[\sqrt{81} = 81^{\frac{1}{2}} = (3^4)^{\frac{1}{2}} = 3\]

b) \[\frac{x^{12}y^8 + x^7y^5 - x^1y^6}{x^6y^4}\]

c) \[\frac{xy^3 + xy^4}{xy^3}\]
d) \( \sqrt[4]{\left(\frac{2a^2 b^8}{3ab^{12}}\right)^4} \)

Solution:

\[
= \left[ \left(\frac{2a^2 b^8}{3ab^{12}}\right)^4 \right]^{\frac{1}{2}} = \left(\frac{2a^2 b^8}{3ab^{12}}\right)^2 = \frac{2^2a^4b^{16}}{3^2a^4b^{24}} = \frac{4a^{4-2}}{9b^{24-16}} = \frac{4a^2}{9b^8}
\]

e) \(-3xy - 3 + 5x^2y + 4xy - 1 + yx^2\)

f) \(-a + b)^2 + ab\)

11. Factorise completely

a) \(3xy^2 + 12x^2y\) [3]

b) \(as + ay - xs + xy\) [4]

12. Reduce the following ratios to the simplest forms: [6]

a) 75mm: 10cm

b) 120: 72

c) 45 minutes: 3 hours

13. Abbey, Bianca and Cecil share N$2500 in the ratio of their ages. Abbey

Who is 6 years old, gets N$600. Bianca is 8 years of age.

a) How much does Bianca get?

b) How old is Cecil?

14. Water from a boiling pot evaporates at the rate of 3ml per second.

In the beginning, there is 4.8 liters of water and remains the same just
before evaporation started. Assume that the rate of evaporation is constant throughout.

a) How much water is left in the pot after 10 minutes of evaporation?

b) How long does it take the whole water to evaporate?

15. Fifteen women can grind a bag of Omahangu in three days. Assume that all women
work at the same rate.

a) How many women can grind the same bag of Omahangu in five days?

b) How many days would it take five women to grind the same bag of
Omahangu?