Present all necessary working in a neat and logical manner.

1. Evaluate the following:

    (a) $6 + 4 \div -2$ (b) $-8 - (4 - 2 \times -1) - 3$ (c) $-0\!\cdot\!3 \times -0\!\cdot\!2$

2. Simplify the following expressions.

    (a) $2\frac{7}{10} + 1\frac{4}{30} - 1\frac{3}{4}$ (b) $1\frac{1}{5} \times 2\frac{7}{8}$ (c) $\frac{7}{10} \div \frac{3}{5}$

3. Evaluate the following:

    (a) $34\!\cdot\!65 - 2\!\cdot\!006$ (b) $1\!\cdot\!4 \div 0\!\cdot\!5$ (c) $(0\!\cdot\!6)^2 + 0\!\cdot\!4 \times 0\!\cdot\!025$

4. Convert the following to a percentages:

    (a) $0\!\cdot\!003$ (b) $1\frac{2}{9}$

5. Convert the following to fractions in their simplest form:

    (a) $0\!\cdot\!05\%$ (b) $15\!\cdot\!5\%$

6. (a) If 15% of a class of 40 girls were absent, how many girls were absent?

    (b) On a monorail journey that lasts one hour Joshua sleeps for 12% of the time. How long does he sleep? (Answer to the nearest second.)

7. Harry invested $1200 for 3 years earning 9·6% simple interest per annum. Calculate:

    (i) The simple interest earned.

    (ii) His total savings at the end of 3 years.

8. The students below gained the following marks in a Maths paper which was marked out of a total of 48. Express each mark as a percentage.

    (a) Eli: 42   (b) Sean : 30.

9. (a) Decrease 340 ml by 15%.

    (b) Hanson buys a computer game for $84 then sells it to Arjun for $105. Calculate his percentage profit on the cost price.

10. Find 100% given that:

    (a) $16\% = \$128$ (b) $124\% = 806\,\text{km}$

11. An amount x is decreased by 12%. This amount is then increased by 6% to obtain $400. Find x.

12. Guang pays 40% deposit on the purchase of a Harley Davidson Motor Cycle with a cost price of $10 000. His monthly repayments for five years are $140. Calculate the simple interest rate p.a. charged on the loan.

13. Evaluate

  (a) $\dfrac{\frac{3}{4} + \frac{2}{3} + \frac{1}{2}}{\frac{3}{8} + \frac{1}{3} - \frac{1}{4}}$

  (b) $\frac{1}{a} + \frac{1}{b}$ given $a = \frac{3}{4}$ and $b = \frac{2}{3}$.

  (c) $2 - (1 - (2 - (1 - (2 - (1 - (2))))))$.

14. If each edge of a cube is increased by 60%, find the percentage increase in surface area.

15. A motor car manufacturer makes m cars per week. If the production is increased by $n\%$ write down an expression that gives the number N of cars made each week.

1. (a) $6 + 4 \div -2 = 6 + -2$
$= 4$ ✓

(b) $-8 - (4 - 2 \times -1) - 3 = -8 - (4 + 2) - 3$
$= -8 - 6 - 3$
$= -14 - 3$ ✓
$= -17$

(c) $-0.3 \times -0.2 = 0.06$ ✓

2. (a) $2\frac{7}{10} + 1\frac{4}{30} - 1\frac{3}{4} = 2\frac{42 + 8 - 45}{60}$ ✓
$= 2\frac{5}{60}$
$= 2\frac{1}{12}$ ✓

(b) $1\frac{1}{5} \times 2\frac{7}{8} = \frac{\overset{3}{\cancel{6}}}{5} \times \frac{23}{\underset{4}{\cancel{8}}}$
$= \frac{69}{20}$ ✓
$= 3\frac{9}{20}$

(c) $\frac{7}{10} \div \frac{3}{5} = \frac{7}{\underset{2}{\cancel{10}}} \times \frac{\overset{1}{\cancel{5}}}{3}$
$= \frac{7}{6}$ ✓
$= 1\frac{1}{6}$

3. (a) $34.65 - 2.006 = 32.644$

$\begin{array}{r} 34.650 \\ 2.006 \\ \hline 32.644 \end{array}$

(b) $1.4 \div 0.5 = 14 \div 5$
$= 2\frac{4}{5}$ ✓

(c) $(0.6)^2 + 0.4 \times 0.025 = 0.36 + 0.01$
$= 0.37$ ✓

4. (a) $0.003 = 0.3\%$ ✓

(b) $1\frac{2}{9} = 1.222\ldots$
$= 122.\dot{2}\%$ ✓

OR

$\frac{11}{9} \times \frac{100}{1}\% = \frac{1100}{9}\%$

$= 122\frac{2}{9}\%$

5. (a) $0.05\% = \frac{0.05}{100}$

$= \frac{5}{10000}$

$= \frac{1}{2000}$ ✓

(b) $15.5\% = \frac{15.5}{100}$

$= \frac{31}{200}$ ✓

6. Girls absent $= 15\% \times 40$

$= \frac{3}{20} \times 40$

$= 6$ ✓

So 6 girls were absent from class.

6(b). later

432 seconds
OR 7 min 12 seconds ✓

7. (i) $I = PRN$

Interest $= \$1200 \times \frac{9.6}{100} \times 3$ ✓

$= \$36 \times 9.6$

$= \$345.60$ ✓

(ii) Total savings $= \$1200 + \$345.60$

$= \$1545.60$ ✓

8. (a) Eli's mark $= \frac{42}{48} \times \frac{100}{1}\%$

$= \frac{7}{8} \times \frac{100}{1}\%$

$= 87\frac{1}{2}\%$ ✓

(b) Sean's mark $= \frac{30}{48} \times \frac{100}{1}\%$

$= \frac{5}{8} \times \frac{100}{1}\%$

$= 62\frac{1}{2}\%$ ✓

9. (a) $\quad 340\,ml \times 85\% = \quad 340\,ml \times \dfrac{17}{20}$

$$= \quad 17 \times 17 \quad ml$$

$$= \quad 289 \quad ml. \quad \checkmark$$

(b) $\quad$ Profit $= \$105 - \$84$ $\quad\checkmark$

$$= \quad \$21$$

Percentage Profit $= \dfrac{21}{84} \times \dfrac{100}{1}\,\%$

$$= \quad 25\% \quad \checkmark$$

10. (a) $\quad 16\%$ of amount $= \$128$
$\quad\quad 4\%$ of amount $= \$32$
$\quad\quad 100\%$ of amount $= \$32 \times 25$
$$= \$800 \quad \checkmark$$

(b) $\quad 124\%$ of distance $= 806\,km$

$$2\% \text{ of distance} = \dfrac{806}{62}\,km$$

$$= 13\,km$$

100% of distance $= 13 \times 50$
$$= 650\,km$$
$\checkmark$

$\dfrac{}{5}\;\checkmark$

11. $\quad 106\% \times 88\% \times x = \$400 \quad \checkmark$

$$x = \dfrac{\$400}{1.06 \times 0.88} \quad \checkmark$$

NASTY NUMBERS!!

$\dfrac{}{2}$

$$x = \$428.82 \quad (\text{nearest } c).$$

6. (b) $\quad$ Length of sleep $= 12\% \times 60 \times 60$

$$= \dfrac{12}{100} \times 3600$$

$$= 12 \times 36$$

$$= 432 \quad \text{seconds} \quad \checkmark$$

12. Deposit = 40% × $10000   Repayments = 5×12×$140
           = $4000   = $8400 ✓

∴ Loan = $6000

$$I = PRN$$
$$2400 = 6000 \times R \times 5$$
$$R = \frac{2400}{5 \times 6000} \quad ✓$$
$$R = \frac{2}{25} \quad ✓$$

so the simple interest rate on the loan is 8% p.a.

13. (a) $\dfrac{\frac{3}{4} + \frac{2}{3} + \frac{1}{2}}{\frac{3}{8} + \frac{1}{3} - \frac{1}{4}} = \dfrac{\frac{9+8+6}{12}}{\frac{9+8-6}{24}}$

$$= \frac{23}{\cancel{12}} \times \frac{\cancel{24}^{\,2}}{11}$$

$$= \frac{46}{11}$$

$$= 4\frac{2}{11}$$

(b) $\dfrac{1}{a} + \dfrac{1}{b} = \dfrac{1}{\frac{3}{4}} + \dfrac{1}{\frac{2}{3}}$

$$= \frac{4}{3} + \frac{3}{2} \quad ✓$$

$$= \frac{8+9}{6} \quad ✓$$

$$= 2\frac{5}{6}$$

(c) $2-\left(1-\left(2-\left(1-\left(2-\left(1-(2)\right)\right)\right)\right)\right) = 2-\left(1-\left(2-\left(1-\left(2-(-1)\right)\right)\right)\right)$

$$= 2-\left(1-\left(2-(1-3)\right)\right)$$

$$= 2-\left(1-(2+2)\right)$$

$$= 2-(-3)$$

$$= 5 \quad ✓$$

6

-4-

14. Let the side length of the cube be 10 units
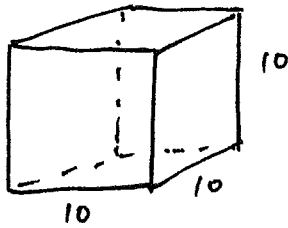
Surface area = 6×100 units^2

New side length = $160\% \times 10$
= 16 units ✓

New surface area = $6 \times 16 \times 16$
= 6×256 units^2 ✓

Increase in S.A. = $6 \times 256 - 6 \times 100$
= 6×156 units^2

Percentage increase in surface area = $\dfrac{6 \times 156}{6 \times 100} \times 100\%$

= 156% ✓

3

15. $N = m\left(1 + \dfrac{n}{100}\right)$

TOTAL

36