1) Write the following numbers in standard form

a) 231000000 2.31×10^8

b) 0.00098 9.8×10^{-4}

2) Write the following as normal numbers

a) 3.41×10^5 $= 341000$

b) 7.9×10^{-6} 0.0000079

3) Write the following recurring decimals as fractions

a) $0.\dot{4}$ $x = 0.4444\ldots$

$10x = 4.4444\ldots$

$9x = 4$

$x = \frac{4}{9}$

b) $0.\dot{2}1\dot{3}$ $x = 0.213213\ldots$

$1000x = 213.213213\ldots$

$999x = 213$

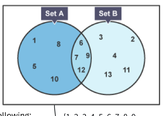
$x = \frac{213}{999} = \frac{71}{333}$

c) 0.216 $x = 0.216$

$1000x = 216$

$x = \frac{216}{1000} = \frac{27}{125}$

4)



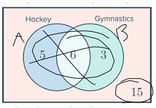
Write the following:

a) $A \cap B$ $= \{6, 7, 9, 12\}$

b) $A \cup B$ $= \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}$

c) A' $= \{2, 3, 4, 11, 13\}$

5) Find the probabilities from the venn diagram below



a) $P(A \cap B)$ $\frac{6}{29}$

b) $P(A \cup B)$ $\frac{14}{29}$

c) $P(B')$ $\frac{20}{29}$

d) $P(A \cap B')$ $\frac{5}{29}$

e) $P(A \cup B)'$ $\frac{15}{29}$

Formulae:

Simple %: $\frac{\%}{100} \times \textbf{number}$

% increase/decrease: $original \times \left(1 \pm \frac{\%}{100}\right)$

% change: $\frac{difference}{original\ value} \times 100$

Compound interest: $original \times \left(1 \pm \frac{\%}{100}\right)^n$

6) Find (giving your answers to 1 decimal place)

a) 6% of 70 $\frac{6}{100} \times 70 = 4.2$

b) 27% of 600 $\frac{27}{100} \times 600 = 162$

7) Find the missing percentage: 53 is _____ % of 78? Give your answ decimal place.

$\frac{x}{100} \times 78 = 53$

$\frac{x}{100} = \frac{53}{78}$

$x = 67.9$

8) 17% of a number is 60. What was the original value? Give your answe decimal place.

$\frac{17}{100} \times x = 60$

$x = 352.9$

9) A meal costs $45 plus 8% service charge. What is the overall cost?

$45 \times \left(1 + \frac{8}{100}\right) = 48.6$

$\$48.60$

10) A shop has a 15% sale on. Below are the original prices of some clothing items. Find the sale prices

a) Trousers $30 $30 \times \left(1 - \frac{15}{100}\right) = 25.5$ $= \$25.50$

11) A soccer ball was sold for $40. In a sale, it now costs $33.50. What was the percentage change? Was it an increase or decrete?

$\frac{6.5}{40} \times 100 = 16.25\%$ Decrease

12) Kwazi invests $5200 into a savings account that has an annual interest rate of 6%. How much money will he have in his account after 5 years?

$5200 \times \left(1 + \frac{6}{100}\right)^5$

$= 6958.77711\ldots$

$= \$6958.77$

13) Pinni bought a car for $8000. Each year its value depreciates by 2.3%. How much can she sell is for after 11 years?

$8000 \times \left(1 - \frac{2.3}{100}\right)^{11}$

$= 6193.450\ldots$

$= \$6193.42$

14) y is directly proportional to x.
When x = 400, y = 10
(a) Find a formula for y in terms of x.
(b) Calculate the value of y when x = 450
(c) Find the value of x when y = 200

a) $y \propto x$

$y = kx$

$10 = k \times 400$

$\frac{10}{400} = k = 0.025$

$y = 0.025x$

b) $y = 0.025 \times 450$

$= 11.25$

c) $200 = 0.025x$

$x = 8000$

15) T is inversely proportional to the cube of L
When L = 0.2, T = 5
(a) Write a formula connecting T and L.
(b) Work out the value of T when L = 0.5
(c) Work out the value of L when T = 2

a) $T \propto \frac{1}{L^3}$

$T = \frac{K}{L^3}$

$5 = \frac{K}{0.2^3}$

$5 \times 0.2^3 = K = 0.04$

$T = \frac{0.04}{L^3}$

b) $T = \frac{0.04}{0.5^3} = 0.32$

c) $T = \frac{0.04}{L^3}$

$2 = \frac{0.04}{L^3}$

$L^3 = \frac{0.04}{2}$

$L^3 = 0.02$

$L = 0.271$

$\sqrt[3]{0.02}$