Percentages 1 – Percentages and Equivalent Fractions

1. Write down the equivalent fraction for each percentage in simplest form.

    e.g $50\% = \dfrac{1}{2}$

    a) 25%   b) 75%   c) 10%   d) 20%   e) $33\dfrac{1}{3}\%$

    f) 40%   g) 5%   h) 80%   i) $66\dfrac{2}{3}\%$ j) 90%

2. Express each percentage as a fraction, then simplify.

    e.g i) $35\% = \dfrac{35}{100} = \dfrac{7}{20}$ ii) $2 \cdot 5\% = \dfrac{2 \cdot 5}{100} = \dfrac{5}{200} = \dfrac{1}{40}$

    a) 24%   b) 65%   c) 14%   d) 38%   e) 95%

    f) 16%   g) 98%   h) 2%   i) $12 \cdot 5\%$ j) $1 \cdot 5\%$

3. Calculate using equivalent fractions.

    e.g   50% of 24

    $= \dfrac{1}{2}$ of 24

    $= 12$

    a) 25% of 80   b) 75% of 32   c) 10% of 350

    d) $33\dfrac{1}{3}\%$ of 90   e) 40% of 35   f) $66\dfrac{2}{3}\%$ of 27

    g) 5% of 140   h) 75% of 280   i) 25% of 1680

Percentages 2 – Finding any percentage of a quantity.

1. By splitting into simpler percentages, calculate the following.

    e.g   Find 15% of 80   10% = 8
                                       5% = 4

                                      15% = 8 + 4
                                          = 12

    a) 35% of 40   b) 65% of 80   c) 12% of 300

    d) 91% of 110   e) 68% of 500   f) 23% of 120

2. By initially finding 1%, calculate the following.
    (Long multiplication, including decimals required from part g.
    onwards)

    e.g   Find 14% of 300   1% = 3
                                              14% = 14 × 3
                                                   = 42

    a) 12% of 200   b) 39% of 500   c) 24% of 400

    d) 8% of 130   e) 9% of 260   f) 7% of 40

    g) 23% of 1200   h) 58% of 2100   i) 26% of 130

    j) 23% of 46   k) 3·7% of 60   l) 8·2% of 140

3. Find, using any appropriate method.

    a) 50% of 90   b) 25% of 360   c) 85% of 40

    d) 17% of 600   e) $33\frac{1}{3}$% of 270   f) 75% of 468

    g) 37% of 85   h) $66\frac{2}{3}$% of 126   i) 5·6% of 140

Percentages 3 – Converting fractions to percentages.

There are several acceptable methods to change fractions to percentages.

1. By finding equivalent fractions with 100 as the denominator, convert to percentages.

e.g i) $\dfrac{7}{20} = \dfrac{35}{100} = 35\%$ ii) $\dfrac{24}{40} = \dfrac{12}{20} = \dfrac{60}{100} = 60\%$

a) $\dfrac{9}{20}$ b) $\dfrac{13}{50}$ c) $\dfrac{23}{25}$ d) $\dfrac{8}{10}$ e) $\dfrac{28}{40}$

2. By changing to decimals and multiplying by 100%, convert to percentages.

e.g $\dfrac{1}{2} = 0.5 \times 100\% = 50\%$

a) $\dfrac{1}{4}$ b) $\dfrac{2}{5}$ c) $\dfrac{3}{10}$ d) $\dfrac{3}{5}$ e) $\dfrac{3}{8}$

3. By multiplying by $\dfrac{100\%}{1}$ then simplifying, convert to percentages.
    (To make life easier, cancel terms before multiplying.)

e.g i) $\dfrac{26}{40} = \dfrac{26}{40} \times \dfrac{100\%}{1} = 65\%$ ii) $\dfrac{5}{8} = \dfrac{5}{8} \times \dfrac{100\%}{1} = \dfrac{25}{2} = 12 \cdot 5\%$

a) $\dfrac{4}{5}$ b) $\dfrac{7}{8}$ c) $\dfrac{1}{8}$ d) $\dfrac{53}{75}$ e) $\dfrac{51}{60}$

4. Find using any appropriate method.

a) The percentage for a class test with a score of 32 out of 40.

b) Ther percentage of males in a club. 25 males, 35 females.

The percentage absence rate of a pupil off 3 out of 180 days.