Solutions - Numeracy Skills

LLE – Mathematics and Statistics

Rounding

1. Round each of the following numbers to the given accuracy.

   (a) $5.8713 = 5.87$ to 2 decimal places (d.p.)

   (b) $15.1119 = 15.11$ to 2 d.p.

   (c) $18.7461 = 18.75$ to 2 d.p.

   (d) $0.878 = 0.88$ to 2 d.p.

   (e) $16.74991 = 16.7$ to 1 d.p.

   (f) $4.06597 = 4.066$ to 3 d.p.

   (g) $14.9811 = 15.0$ to 1 d.p.

2. Round each of the following numbers to the given accuracy.

   (a) $14.583 = 14.6$ to 3 significant figures (s.f.)

   (b) $4.14448 = 4.14$ to 3 s.f.

   (c) $654329 = 654000$ to 3 s.f.

   (d) $478.3 = 480$ to 2 s.f.

   (e) $56.39 = 56$ to 2 s.f.

   (f) $0.00467 = 0.005$ to 1 s.f.

   (g) $498.9 = 500$ to 2 s.f.

Fractions

1. Simplify the following fractions to their lowest form.

   (a) $\frac{6}{10} = \frac{2 \times 3}{2 \times 5} = \frac{3}{5}$

   (b) $\frac{12}{24} = \frac{12 \times 1}{12 \times 2} = \frac{1}{2}$

   (c) $\frac{15}{24} = \frac{3 \times 5}{3 \times 8} = \frac{5}{8}$

   (d) $\frac{81}{99} = \frac{9 \times 9}{9 \times 11} = \frac{9}{11}$

2. Evaluate, without using a calculator, giving your answer in its simplest form.

   (a) $\frac{4}{5} \times \frac{2}{3} = \frac{8}{15}$

   (b) $\frac{3}{4} \times \frac{2}{9} = \frac{6}{36} = \frac{1}{6}$

   (c) $\frac{2}{7} \times \frac{5}{12} = \frac{10}{84} = \frac{5}{42}$

   (d) $\frac{5}{8} \div \frac{3}{4} = \frac{5}{8} \times \frac{4}{3} = \frac{20}{24} = \frac{5}{6}$

   (e) $\frac{2}{5} \div \frac{7}{10} = \frac{2}{5} \times \frac{10}{7} = \frac{20}{35} = \frac{4}{7}$

   (f) $\frac{5}{8} \div \frac{2}{5} = \frac{5}{8} \times \frac{5}{2} = \frac{25}{16}$ or $1\frac{9}{16}$

   (g) $\frac{5}{6} \times \frac{2}{5} \times \frac{9}{10} = \frac{90}{300} = \frac{3}{10}$

3. Evaluate, without using a calculator, giving your answer in its simplest form.

   (a) $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$

   (b) $\frac{7}{10} - \frac{3}{10} = \frac{4}{10} = \frac{2}{5}$

   (c) $\frac{3}{8} + \frac{1}{4} = \frac{3}{8} + \frac{2}{8} = \frac{4}{8} = \frac{1}{2}$

   (d) $\frac{5}{12} + \frac{5}{18} = \frac{15}{36} + \frac{10}{36} = \frac{25}{36}$

   (e) $\frac{9}{10} - \frac{4}{15} = \frac{27}{30} - \frac{8}{30} = \frac{19}{30}$

Ratio

1. The ratio of red counters to blue counters is 3:5. Given there are 96 counters, how many of the counters are blue?
   $3 + 5 = 8$ there are 8 parts in total.
   Divide the total counters of 96 into the 8 parts: $96 \div 8 = 12$.
   So each part is 12 counters. Therefore blue counters is $5 \times 12 = 60$

2. The ratio of left-handed people to right-handed people in a room is 2:7. Given there are 28 right-handed people, how many people are in the room?
   Right-handed people are 7 parts, so each part is $28 \div 7 = 4$.
   There are $2 + 7 = 9$ parts in total, so $9 \times 4 = 36$ people in total.

3. In a workforce there are 1.5 times as many full-time employees as part time employees. Given that there are 120 people employed, how many of them are full-time?
   Part time to full time is $1 : 1.5$ or $2 : 3$
   Using $2 : 3$ we have 5 parts representing 120 people, so each part is $120 \div 5 = 24$.
   Full time is 3 parts, so $3 \times 24 = 72$ full-time employees.

Percentages

1. Find the following values:

   (a) 45% of $£20 = 0.45 \times 20 = £9$

   (b) 75% of $£150 = 0.75 \times 150 = £112.50$

   (c) 28% of $£25 = 0.28 \times 25 = £7$

   (d) 140% of $£60 = 1.4 \times 60 = £84$

2. A company increases people's wages.

Wage	Percentage Pay Rise
up to £20000	8 %
£20000 to £34999	5 %
over £35000	3 %

Find the new wage of the following employees:

(a) Person A $£31000 + 0.05 \times 31000$ or $1.05 \times 31000 = £32550$

(b) Person B $£18000 + 0.08 \times 18000$ or $1.08 \times 18000 = £19440$

(c) Person C $£44000 + 0.03 \times 44000$ or $1.03 \times 44000 = £45320$

3. A store has a sale where there is 15 % off everything. If an item cost £84 before the sale, what is the price now?
15% off is $100 - 15 = 85\%$ of value
$0.85 \times 84 = £71.40$

4. Below is a list of sale prices after a given discount has been a applied. Work out the price before the sale. Check your answers by applying the discount to your calculated original price.
Since we are reversing a percentage change, we need to divide rather than multiply.

Original Price	Discount	Sale Price
$10 \div 0.5 = £20$	50 %	£10
$20 \div 0.8 = £25$	20 %	£20
$34 \div 0.85 = £40$	15 %	£34
$41.80 \div 0.95 = £44$	5 %	£41.80

Standard Form

1. Write the following numbers in standard form (scientific notation).

(a) $450000 = 4.5 \times 10^5$

(b) $2500000 = 2.5 \times 10^6$

(c) $14500 = 1.45 \times 10^4$

(d) 25 million $= 25000000 = 2.5 \times 10^7$

(e) $0.00056 = 5.6 \times 10^{-4}$

(f) $0.003 = 3 \times 10^{-3}$

(g) $0.00000012 = 1.2 \times 10^{-7}$

2. Write the following numbers out in full.

(a) $2.5 \times 10^4 = 25000$

(b) $1.25 \times 10^5 = 125000$

(c) $1.6 \times 10^{-3} = 0.0016$