



Using a calculator

- Using a calculator for more complex calculations
- Writing answers using a format consistent with the question
- Converting time given in decimal format into hours, minutes and seconds
- Using unrounded numbers in calculations that rely on previous results

Keywords

You should know

explanation 1a

explanation 1b

1 For each calculation

i work out the answer using a calculator

ii check your answer by doing the calculation in your head

a $\frac{6+4}{2}$

b $\frac{6}{2} + 4$

c $6 + \frac{4}{2}$

d $\frac{20-8}{4}$

e $\frac{20}{4} - 8$

f $20 - \frac{8}{4}$

g $\frac{5^2 + 15}{10}$

h $\frac{5^2}{10} + 15$

i $5^2 + \frac{15}{10}$

j $\frac{(12-8)^2}{2}$

k $\frac{12^2 - 8^2}{2}$

l $\frac{12^2}{2} - \frac{8^2}{2}$

2 Use a calculator to work these out.

a $\frac{3.6 + 2.1^2}{6 - 5.1}$

b $\frac{22^2 - 3.8^2}{17 + 8}$

c $\frac{48 - (3.7 + 9.8)^2}{5}$

d $4.1 \times (8.6 - 2.5)^2$

e $(3.2 \times 6.8)^2 - (8.1 \times 2.1)^2$

f $\left(\frac{3.8}{19}\right)^2 - 3.6$

g $\frac{8.5}{10 \times 3.4} + 6.2$

h $\sqrt{\frac{4.5 \times 8}{4}}$

i $\sqrt{\frac{28 \times 3}{4.2 \times 5}} + 9$

3 The formula for converting degrees Celsius ($^{\circ}\text{C}$) to degrees

Fahrenheit ($^{\circ}\text{F}$) is $F = \frac{9}{5}C + 32$

a Use a calculator to convert these temperatures from $^{\circ}\text{C}$ to $^{\circ}\text{F}$.

i 30°C

ii 18°C

iii 0°C

iv -5°C

v -40°C

b In order to estimate each answer, the formula can be rewritten as $F \approx 2C + 30$.

Without a calculator, estimate the answers to part **a** using this formula.

- 4 a** Copy and complete this function machine for the formula $F = \frac{9}{5}C + 32$



- b** Draw the inverse function machine and use it to write a formula for converting degrees Fahrenheit ($^{\circ}\text{F}$) to degrees Celsius ($^{\circ}\text{C}$).
- c** Use a calculator to convert these temperatures from $^{\circ}\text{F}$ to $^{\circ}\text{C}$.

i 100°F

ii 70°F

iii 0°F

iv 32°F

v -40°F

vi -76°F

- d** In order to estimate each answer, the formula can be rewritten as

$$C \approx \frac{1}{2}F - 15$$

Without a calculator, estimate the answers to part **c** using this formula.

explanation 2a

explanation 2b

Use the following information to answer questions **5–8**.

These were the exchange rates between pounds (£) and some other currencies in December 2007.

£1 = 1.41 euros

£1 = 228.49 Japanese yen

£1 = 2.06 US dollars

£1 = 15.21 Chinese yuan



- 5** Assuming there are no additional bank charges, calculate the amount in pounds that would be given in exchange for these amounts.

a 1000 euros

b 500 US dollars

c 10 000 Japanese yen

d 600 Chinese yuan

e 400 euros and 8000 Japanese yen

f 450 US dollars, 320 Chinese yuan and 6500 Japanese yen

- 6 a** How many US dollars are equivalent to 500 euros?
b How many Chinese yuan are equivalent to 650 Japanese yen?
c How many euros are equivalent to 100 Japanese yen?
d How many US dollars are equivalent to 10.20 Chinese yuan?
- 7 a** A family of four, pay \$67 for a meal while on holiday in the USA. Calculate the cost of the meal in pounds.
b A couple pay 650 yuan for an extra tour whilst visiting China. Calculate the price of the tour in pounds.
c An American on holiday in Europe pays 86 euros for a train journey. Calculate the cost of the train ticket in US dollars.
- 8 a** Work out the new exchange rate for euros, US dollars, yen and yuan if the value of the pound increases by 15% from its value in December 2007.
b Work out the new exchange rate for euros, US dollars, yen and yuan if the value of the pound decreases by 7% from its value in December 2007.
- 9** Mark went to Italy on holiday in December 2007. He changed £150 into euros. He went on holiday the following year and again changed £150 into euros, but during the year the value of the pound had fallen against the euro by 9%. How many fewer euros did Mark get on his second holiday?

explanation 3

- 10** Write each of these parts of a day in hours.
a 0.5 of a day **b** 0.75 of a day **c** 0.625 of a day
- 11** Write each of these parts of an hour in minutes.
a 0.2 of an hour **b** 0.75 of an hour **c** $0.8\dot{3}$ of an hour
d $0.\dot{6}$ of an hour **e** 0.35 of an hour **f** $0.3\dot{6}$ of an hour

12 Write these times in hours and minutes.

- | | | |
|--------------------|---------------------|----------------------|
| a 3.5 hours | b 4.75 hours | c 1.8 hours |
| d 1.1 hours | e 7.65 hours | f 12.35 hours |

13 A pupil spends $\frac{1}{3}$ of the day sleeping and $\frac{1}{10}$ of the day eating.

- a** Calculate the total amount of time he spends either eating or sleeping.
Give your answer in hours and minutes.
- b** He spends $\frac{1}{4}$ of the remaining time playing with friends.
How many hours and minutes is this?

14 Over a period of 5 hours in an evening Sage spent $\frac{1}{4}$ of the time doing her homework, $\frac{1}{3}$ of the time watching television, $\frac{1}{8}$ of the time talking to friends on the phone and the rest of the time doing other things.

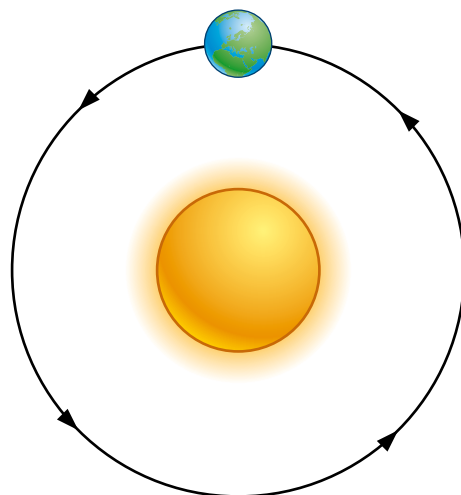
Calculate the following.

- a** The time in hours and minutes that she spent doing homework.
- b** The time in hours and minutes that she spent watching television.
- c** The time in hours and minutes that she spent talking to friends.
- d** The fraction of her evening spent doing other things.
- e** The time in hours and minutes that she spent doing other things.

15 The Earth takes approximately 365 days (1 year) to orbit the Sun. It therefore takes 365 days to do a full 360° rotation around the Sun.

Calculate the number of days, hours and minutes it takes to rotate the following number of degrees around the Sun.

- | | | |
|----------------------|---------------------|---------------------|
| a 180° | b 90° | c 10° |
| d 1° | e 17° | |



- 16** The Earth takes 24 hours (1 day) to rotate 360° on its axis.
Calculate the number of hours and minutes the Earth takes to rotate through the following angles.

a 60° **b** 45° **c** 20° **d** 1° **e** 19°

explanation 4

17 $p = \sqrt{5}$ and $q = \frac{74}{p-2}$

- a** Calculate the value of p to 1 d.p.
b Calculate the value of q to 1 d.p.
c Zac tries to calculate q using the rounded value of p . What is Zac's answer?

Remember to use
the **Ans** key.

- 18** A stack of 9 tiles has a height of 110 mm.
a Calculate the thickness of each tile to the nearest millimetre.
b How many of these tiles will fit under a shelf 300 mm high?
- 19** The area of a square is 8 cm^2 .
a Calculate the length of each side of the square to the nearest centimetre.
b Calculate the perimeter of the square to the nearest centimetre.
- 20** The volume of a cube is 160 cm^3 .
a Calculate the length of each edge of the cube to the nearest centimetre.
b Calculate the area of each face of the cube to the nearest square centimetre.
- 21** A tourist was given the exchange rate 248 Mexican pesos for £12.153 243 8.
a What was the value of £1 to the nearest Mexican peso?
b What was the value of £735 to the nearest Mexican peso?