Planner

Place value, ordering and rounding

- Working with negative powers of 10
- Multiplying and dividing integers and decimals by any power of 10
- Rounding numbers to a given power of 10
- Rounding numbers to either 1 or 2 decimal places
- Rounding decimals to the nearest whole number

Keywords

You should know

explanation 1

1 Write these numbers as powers of 10.

a one hundred **b** one thousand **c** ten

d ten thousand **e** one million **f** one hundred thousand

g one **h** one billion

One billion = one thousand million

2 Write these as powers of 10.

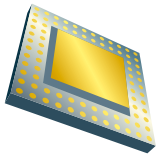
a one hundredth **b** one thousandth **c** one millionth

3 Copy and complete these statements using powers of 10.

a 1 m = ☐ cm **b** 1 cm = ☐ m **c** 1 cm = ☐ mm

d 1 mm = ☐ cm **e** 1 m = ☐ mm **f** 1 mm = ☐ m

4 Tiny transistors inside computer chips are now as small as 45 nanometres.



One nanometre (nm) = one billionth of one metre.

Copy and complete each identity using a power of 10.

a 1 nm = ☐ m **b** 1 nm = ☐ mm **c** 1 cm = ☐ nm

5 Write these expressions as numbers without using powers.

a 2×10^2 **b** 4×10^3 **c** 9×10^4 **d** 7×10^5

e 8×10^6 **f** 2.1×10^3 **g** 0.35×10^3 **h** 1.25×10^2

6 Write each number as a multiple of a power of 10.

a six hundred
b five thousand
c eighty thousand
d one hundred thousand
e three million
f two hundred million
g seven hundredths
h nineteen thousandths

explanation 2a explanation 2b

7 Work these out without using a calculator.

a 23×0.1
b 99×0.1
c 149×0.01
d 8×0.01
e 765×0.001
f 55×0.001
g 9×0.01
h $6581 \times 0.1 \times 0.01$
i $62 \times 0.01 \times 0.01$

8 Work these out without using a calculator.

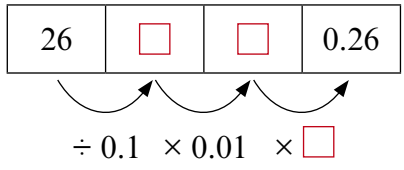
a $3 \div 0.1$
b $20 \div 0.1$
c $169 \div 0.1$
d $100 \div 0.1$
e $2 \div 0.01$
f $14 \div 0.01$
g $128 \div 0.01$
h $5 \div 0.1 \div 0.01$
i $85 \div 0.01 \div 0.01$

9 Find the missing numbers in each of these calculations.

a $14 \times 0.1 = \square$
b $360 \times 0.01 = \square$
c $78 \times \square = 0.78$
d $420 \times \square = 42$
e $\square \times 0.01 = 20$
f $\square \div 0.1 = 160$
g $\square \div 0.01 = 3000$
h $35 \div \square = 350$
i $\square \div 0.01 = 27$

10 Copy and complete each diagram.

a



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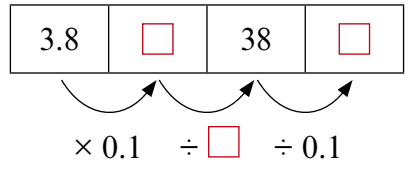
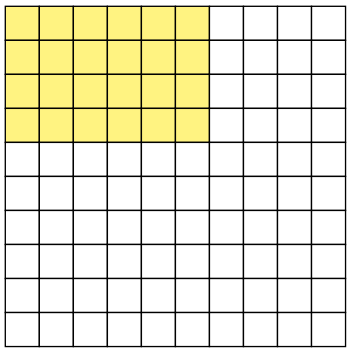


explanation 3 online

11 Write a multiplication and its answer for each diagram. The side length of each small square is $\frac{1}{10}$ of the side length of the large square.

a



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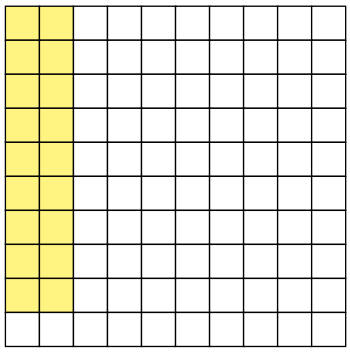

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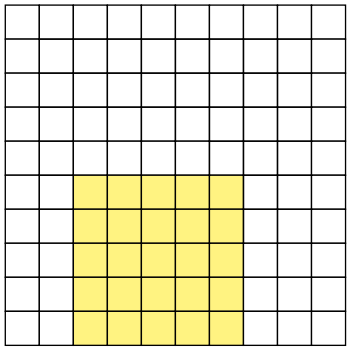
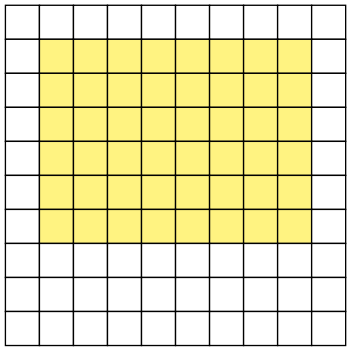


d



12 Write a division and its answer for each of the diagrams in question **11**.

13 Work these out without using a calculator.

a 0.3×0.2 **b** 0.8×0.4 **c** 0.5×0.9

d $0.6 \div 0.3$ **e** $0.6 \div 0.2$ **f** $0.9 \div 0.1$

14 Work these out without using a calculator.

a 1.2×0.1 **b** 2.4×0.2 **c** 1.5×0.01

d $2.5 \div 0.1$ **e** $3.6 \div 0.01$ **f** $4.8 \div 0.2$

15 Find the missing number in each calculation without using a calculator.

a $0.4 \times 0.1 = \square$

b $0.2 \times 0.01 = \square$

c $0.8 \times \square = 0.24$

d $0.7 \times \square = 0.56$

e $\square \times 0.01 = 0.03$

f $\square \times 0.01 = 0.006$

g $12 \times \square = 2.4$

h $\square \times 8 = 3.2$

explanation 4 online

16 Round each number to the degree of accuracy given.

a 823 (nearest 100)

b 102 (nearest 10)

c 1678 (nearest 1000)

d 2590 (nearest 100)

e 500 (nearest 1000)

f 20 999 (nearest 1000)

17 **a** The number of people attending a football match is exactly 67 189.

Round the number to these degrees of accuracy.

i the nearest 10

ii the nearest 100

iii the nearest 1000

iv the nearest 10 000

b The number of people voting in a local election was recorded as exactly 1 628 599.

Round the number to these degrees of accuracy.

i the nearest million

ii the nearest 100 000

iii the nearest 10 000

iv the nearest 1000

v the nearest 100

vi the nearest 10

18 Round these measurements to the degree of accuracy given.

a 27 mm (nearest centimetre)

b 384 mm (nearest centimetre)

c 9721 ml (nearest litre)

d 448 cm (nearest metre)

e 17 600 g (nearest kilogram)

f 957 mm^2 (nearest square centimetre)

explanation 5a | explanation 5b | online

19 Round each number to 1 decimal place.

a 23.69 **b** 1.82 **c** 9.94 **d** 6.97

e 19.93 **f** 19.98 **g** 19.95 **h** 100.04

20 Round each number to 2 decimal places.

a 41.671 **b** 80.0453 **c** 1.007 **d** 30.0045

e 3.3333... **f** 6.6666... **g** 9.9999... **h** 100.0045

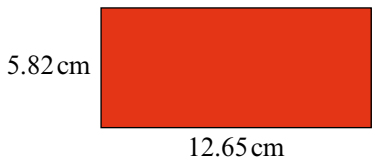
21 Use a calculator to do each calculation.
Write your answer to the number of decimal places (d.p.) given.

a 6 ÷ 9 (1 d.p.) **b** 17 ÷ 11 (1 d.p.) **c** 17 ÷ 11 (2 d.p.)

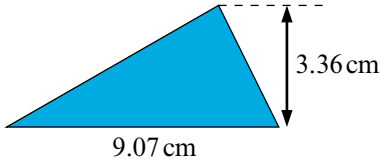
d 14 ÷ 17 (1 d.p.) **e** 20 ÷ 100 (2 d.p.) **f** 7 ÷ 9 (2 d.p.)

22 Use a calculator to find the area of each shape.
Write your answer to the nearest whole number.

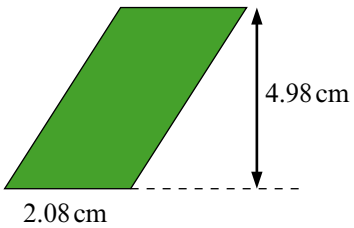
a



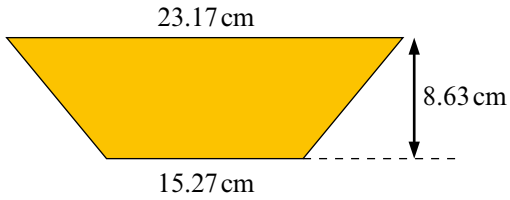
b



c



d



23 A square has area 60 cm^2. Use a calculator to find these lengths.
Write your answers to the nearest centimetre.

a The length of each side of the square

b The perimeter of the square