Checking

- Working out complex calculations involving brackets and powers
- Setting out complex calculations in stages
- Spotting incorrect answers in a number of different situations

Keywords

You should know

explanation 1

1 Copy and complete these calculations.
Follow the rules for the order of operations.

a $3 + 7 \times 4 = 3 + \square =$

b $4 \times 8 + 9 = \square + 9 =$

c $11 - 12 \div 4 = 11 - \square =$

d $18 - 5 \times 2 =$

e $6 \times 14 \div 7 =$

f $15 \div 3 - 4 =$

2 Petra worked out this calculation.

What is her mistake?

Write down the correct answer.

$7 \times (2 + 3)$
$14 + 3$
17

3 Work these out.

a $(7 - 3) \times 4$

b $(9 + 3) \div 6$

c $2 \times (8 + 7)$

d $12 \times (17 - 7)$

e $24 \div (16 - 4)$

f $(3 + 9) \times (14 - 4)$

4 Copy and complete each calculation.
Each $\square$ stands for an operation $(+, -, \times$ or $\div)$.

a $19 \square 2 \times 7 = 5$

b $21 \square 3 + 7 = 14$

c $8 + 11 \square 9 = 10$

d $4 \square 3 + 21 = 33$

e $5 + 7 \square 3 = 26$

f $15 \square 3 \square 5 = 10$

5 Work these out.

a $14 - 4 \times 3$

b $(14 - 4) \times 3$

c $21 \div 3 + 4$

d $21 \div (3 + 4)$

e $(18 \div 3) \div 2$

f $3 + (6 \div 2)$

g $18 \div 3 + 6 \div 2$

h $18 \div (3 + 6) \div 2$

i $(18 - 3) \div (6 \div 2)$

6 Work these out.

a $3 + 4^2$
b $(3 + 4)^2$
c $3^2 + 4^2$

d $4^2 + 6 \div 2$
e $(4 + 6)^2 \div 2$
f $4 + (6 \div 2)^2$

7 Each of these calculations is incorrect.
Copy these statements and add brackets to make them true.

a $16 \div 4 + 4 = 2$
b $5 + 3 \times 11 = 88$

c $17 - 5 \div 2 = 6$
d $19 - 7 + 8 = 4$

e $30 \div 7 + 3 = 3$
f $8 \times 13 - 5 = 64$

g $5 \times 3 \times 2 + 2 = 60$
h $8 - 2 \times 12 - 9 = 18$

i $17 - 5 \div 24 - 18 = 2$
j $4^2 - 8 \div 4 = 2$

> Use two sets of brackets for parts **h** and **i**.

8 Sarah hires a tool for three days. She pays an intial fee of £10 and then a daily charge of £5. She calculates that she owes $10 + 3 \times 5 = 13 \times 5 = $ £65.
Correct her mistake.

9 Dev wants to buy five books.
Two of the books cost £6 each and the other three books cost £3 each.
He works out that these will cost $6 \times 2 + 3 \times 3 = 6 \times 5 \times 3 = $ £90.
Explain what he has done wrong.

10 Match each calculation to its answer.

$$\frac{(13 - 3)^2}{5^2}$$

4

2

$$\frac{13 - 3}{5}$$

$$\frac{(13 - 3)^2}{5}$$

20

11 Which of these calculations are true?

a $6 + 24 \div 6 + 4 = 14$
b $6 + 24 \div 6 + 4 = 9$

c $6 + 24 \div 6 + 4 = 3$
d $16 + 4^2 \times 8 - 3 = 141$

e $16 + 4^2 \times 8 - 3 = 96$
f $16 + 4^2 \times 8 - 3 = 160$

12 Use the rules of BIDMAS to write calculations which give the numbers from 1 to 20 using only the numbers 1, 2, 3, and 4 along with +, −, ×, ÷ and brackets. You may only use each number once in any calculation.

explanation 2

13 Estimate the answers to these calculations. The first one has been done for you.

a $7.1 + 12.8 \approx 7 + 13 = 20$

b $25.2 - 13.9$ c $27.8 + 11.1$

d 6.9×2.2 e $18.1 \div 5.9$

f $25.2 \div 5.1$ g $6.7 + 7.6$

h $15.5 - 4.2$ i $2.3 \times 4.8 + 10.9$

> Remember to round each decimal to the nearest whole number.

14 Use the rules of BIDMAS to work these out.

a $14 \times 2 + 9$ b $24 \div 6 - 7$ c $25 + 7 - 4$

d $7 + 8 \div 2$ e $19 - 5 \times 3$ f $20 \div 4 + 27$

g $56 + 8 \div 8$ h $16 \div 8 \times 2$ i $31 - 11 + 6 \div 3$

15 In each pair of calculations one answer is wrong.
Estimate the answer to decide which calculation is correct.

a i $14.1 - 3.8 = 17.2$ ii $14.1 - 3.8 = 10.3$

b i $24.9 - 13.7 = 11.2$ ii $24.9 - 13.7 = 16.8$

c i $8.8 + 14.9 = 23.7$ ii $8.8 + 14.9 = 19.7$

d i $\dfrac{27.3 \times 2.9}{9.1} = 8.7$ ii $\dfrac{27.3 \times 2.9}{9.1} = 0.87$

16 Peter uses estimation to work out the calculation $(4.2 + 3.7)^2$.

How could Peter have made a better estimate?

$(4 + 3)^2$
$= 7^2$
$= 49$

17 Here are some calculations.
Three possible answers have been given to each one but only one is right.
Use estimation to find the correct answer in each case.
Do not use a calculator.

a 58×60 **i** 3480   **ii** 348   **iii** 4080

b $5.98 \div 2.12$ **i** 1.66   **ii** 2.82   **iii** 0.92

c $327 \div 1.1$ **i** 297.27   **ii** 29.73   **iii** 329.11

d 1001×2.1 **i** 2001.1   **ii** 2102.1   **iii** 1999.1

18 Here is the specials board for a restaurant.

Sarah orders the full meal.
Her bill comes to £18.
Use estimation to check if this is correct.

Specials

Shepherd's pie   £7.95
Lemon tart   £3.70
Coffee   £1.75

19 Bethany has £20. Does she have enough money to buy three books costing £7.75 each? Use estimation to find out.

20 David thinks the journey from London to Newcastle, stopping at Birmingham and Manchester on the way, is about 700 km. Use estimation to check whether he is right. Write a sentence to explain your findings.

From	To	Distance (km)
London	Birmingham	190.5
Birmingham	Manchester	135.3
Manchester	Newcastle	232.1

21 Amir gets paid £4.95 an hour.

a He works for 4 hours on Saturday and for 5 hours on Sunday. Estimate how much he gets paid.

b Roughly how many hours must Amir work to earn £100?

22 Suzy's car can travel 34.68 miles on one gallon.
Approximately how much petrol does she need to travel 350 miles?