1 Evaluate these expressions.

   a $(4 - 8) \times 3$

   b $(^-2 + 1) \times {}^-7$

   c $5 - {}^-2 + {}^-3$

   d $40 - {}^-8 \times 2$

   e $^-6 + 2 \times {}^-4$

   f $^-60 \div {}^-30 \div {}^-2$

   g $20 - {}^-3 + 8$

   h $14 + {}^-2 \times {}^-5$

   i $^-4 \times (8 - {}^-2)$

   j $30 - {}^-3 \times 4$

2 Evaluate these expressions.

   a $^-8 \times 5 + {}^-7$

   b $^-8 - 4 \times {}^-5$

   c $20 \div {}^-5 + 1$

   d $^-1 \times 8 - {}^-4$

   e $^-4 \times {}^-3 \div 2$

   f $12 \div {}^-3 \times {}^-2$

   g $^-1 \times (^-3 + {}^-8)$

   h $^-10 + {}^-2 \times {}^-3$

   i $(^-1 + {}^-2) \times {}^-3$

   j $\dfrac{^-13 + 5}{^-2}$

1 Bernice has a balance of exactly \$27 in her cheque account. She writes a cheque for \$51.

   a When the cheque is cashed, will the account be in credit or overdrawn?

   b Explain what her new balance will be. Write an integer expression to show what happens to her account.

2 In Queenstown the temperature at dawn during the Winter Festival was $^-9\,°C$. By midday the temperature was $4\,°C$. Write down an expression, and the result, to show how much the temperature had risen.

3 Here is a page from Ian's chequebook. Work out the amounts **a**–**e** in the last column.

Details	Deposit	Withdrawal	Opening balance: 32 OD
Shirt		46	**a**
CD		19	**b**
Birthday present	100		**c**
Red Cross donation		15	**d**
Pocket money	25		**e**

4 A car-park has 12 storeys altogether. One is at street-level, eight are above ground, and three are below ground. The lift controls are marked 8, 7, …, 1, 0, U1, U2 and U3.

   a Which level is six levels above level U1?

   b Which level is nine levels below level 7?

5 The temperature at dawn at Fairlie is ⁻6 °C one day in winter. What is the temperature 8 hours later if it is 19 °C warmer?

6 Julius Caesar and Cleopatra were one of the most famous couples of ancient history. This table gives their dates of birth and death:

	Date of birth	Date of death
Julius Caesar	12 July 102 BC	15 March 44 BC
Cleopatra	January 69 BC	12 August 30 BC

    a How old was Julius Caesar when he died?

    b How old was Cleopatra when she died?

    c What was the age difference between Julius Caesar and Cleopatra?

    d Cleopatra's grandson was Ptolemy of Mauretania. He died 70 years after Cleopatra died. In what year did he die?

7 Roseanne is sitting a multichoice test. Each correct answer is awarded 4 marks. Each incorrect answer loses 7 marks. Altogether she gets 10 questions correct and five questions wrong.

    a Write down an expression using 4, ⁻7, 10 and 5 to show Roseanne's total number of marks.

    b Work out the expression in part **a** to find this total.

8 In golf each hole has a 'par' score, which gives the number of shots a good golfer should take to place the ball in the hole. Sometimes a golfer goes 'under par', which means it takes fewer shots, or 'over par'. This table gives the description for what happens on a particular hole.

Description	Number of shots	Integer
Albatross	3 below par	⁻3
Eagle	2 below par	⁻2
Birdie	1 below par	⁻1
Par	Par	0
Bogey	1 over par	1
Double bogey	2 over par	2

Most championship courses are 'par-72'. They are designed so that a professional golfer should take 72 shots over 18 holes.

    a One golfer writes his score over 18 holes as follows:

$$72 + 0 + {}^-1 + 0 + 0 + 1 + 0 + {}^-1 + 1 + 0 + 0 + {}^-2 + 0 + 0 + 1 + {}^-1 + {}^-1 + 0 + 1$$

       i How many birdies did the golfer get?

      ii What was the golfer's final score?

    b Another golfer got one albatross, five birdies and two bogeys. They were playing on a par-72 course.

       i How many pars did the golfer get?

      ii What was the golfer's final score?

1 Write these expressions in power form.

   a $8 \times 8 \times 8 \times 8$

   b $5 \times 5 \times 5 \times 5 \times 5 \times 5$

   c 4×4

   d $13 \times 13 \times 13$

   e $^-1 \times {}^-1 \times {}^-1$

   f $^-7 \times {}^-7 \times {}^-7 \times {}^-7 \times {}^-7 \times {}^-7$

2 Write these expressions in full.

   a 3^4 **b** 10^3

   c $(^-3)^7$ **d** $(^-2)^8$

3 Evaluate these powers.

   a 3^2 **b** 14^2

   c 8^3 **d** 2^9

   e 6^4 **f** 4^7

   g 9^1 **h** 405^1

4 Evaluate these powers of negative numbers.

   a $(^-4)^2$ **b** $(^-2)^5$

   c $(^-3)^6$ **d** $(^-1)^8$

   e $(^-25)^2$ **f** $(^-11)^5$

5 Use a calculator to work out these powers of decimals.

   a $(3.1)^2$ **b** $(4.9)^3$

   c $(7.62)^2$ **d** $(6.25)^3$

   e $(0.5)^4$ **f** $(0.12)^2$

6 Use a calculator to work out these expressions.

   a $2^3 + 3^2$

   b $4^5 - 4^4$

   c $2^6 + 2^4$

   d $15^2 + 8^2 - 17^2$

   e $101^2 - 99^2$

   f $1^2 + 2^3 + 3^4 + 4^5$

7 Decide whether these equations are true or false.

   a $2^5 = 5^2$ **b** $4^2 = 2^4$

   c $8^2 + 6^2 = 10^2$ **d** $11^2 + 12^2 = 13$

   e $2^3 + 3^3 = 4^3$ **f** $2^4 \times 5^4 = 10^4$

8 Use a calculator to work out these expression

   a $2^8 \times 2^7$ **b** $4^3 \times 4^2$

   c $9^7 \div 9^5$ **d** $8^4 \div 8^3$

   e $(2^3)^4$ **f** $(3^2)^3$