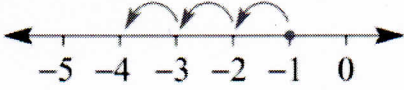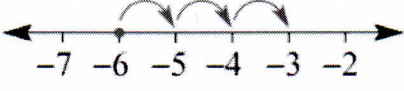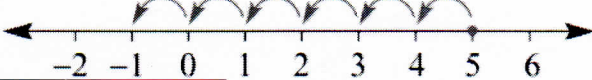1 In which direction (i.e. right or left) on a number line do you move for the following
   calculations?

   a   2 is added to –5   *right*   b   6 is added to –4   *right*
   c   4 is subtracted from 2 *left*   d   3 is subtracted from –4 *left*

2 Match up the problems **a** to **d** with the number lines **A** to **D**.

   a $5 - 6 = -1$ A
                                           -3 -2 -1 0 1 2 3

   b $-2 + 4 = 2$ B
                                           -5 -4 -3 -2 -1 0

   c $-1 - 3 = -4$ C
                                           -7 -6 -5 -4 -3 -2

   d $-6 + 3 = -3$ D
                                           -2 -1 0 1 2 3 4 5 6

3 Calculate the answer to these additions. Check your answers using a calculator.

   a $-1 + 2 = 1$ b $-1 + 4 = 3$ c $-3 + 5 = 2$ d $-10 + 11 = 1$
   e $-4 + 3 = -1$ f $-5 + 2 = -3$ g $-11 + 9 = -2$ h $-20 + 18 = -2$

4 Calculate the answer to these subtractions. Check your answers using a calculator.

   a $4 - 6 = -2$ b $7 - 8 = -1$ c $3 - 11 = -8$ d $1 - 20 = -19$
   e $-3 - 1 = -4$ f $-5 - 5 = -10$ g $-2 - 13 = -15$ h $-7 - 0 = -7$

5 Find the missing number.

   a $2 + \boxed{5} = 7$ b $-2 + \boxed{9} = 7$ c $-2 + \boxed{5} = 3$ d $-4 + \boxed{2} = -2$
   e $5 - \boxed{5} = 0$ f $3 - \boxed{7} = -4$ g $-9 - \boxed{3} = -12$ h $-20 - \boxed{10} = -30$

6 Evaluate the following. Remember to work from left to right.
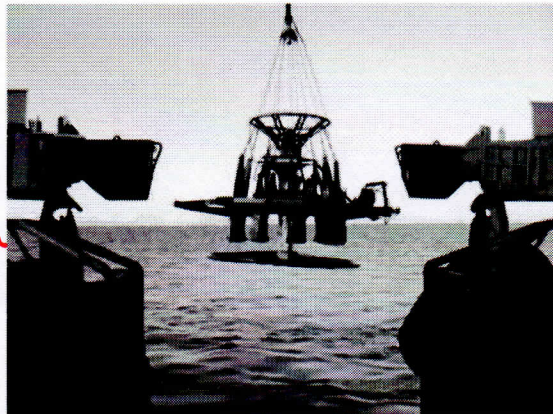
   a $3 - 4 + 6 = 5$ b $2 - 7 - 4 = -9$ c $-1 - 4 + 6 = 1$ d $-5 - 7 - 1 = -13$
   e $-3 + 2 - 7 + 9 = 1$ f $-6 + 1 - 20 + 3 = -22$ g $0 - 9 + 7 - 30 = -32$ h $-15 - 20 + 32 - 1 = -4$

7 Determine how much debt remains in these financial situations.

   a   owes $300 and pays back $155 *$145*   b   owes $20 and borrows another $35
   c   owes $21 500 and pays back $16 250   *$55*
                                           $5,250

8 a The reading on a thermometer measuring temperature rises 18°C from −15°C. What is the final temperature? *3°C*

b The reading on a thermometer measuring temperature falls 7°C from 4°C. What is the final temperature? *−3°C*

c The reading on a thermometer measuring temperature falls 32°C from −14°C. What is the final temperature? *−14 − 32 = −46°C*

−28 → +18 → −23

9 For an experiment, a chemical solution starts at a temperature of 25°C, falls to −3°C, rises to 15°C and then falls again to −8°C. What is the total change in temperature? Add all the changes together for each rise and fall. *−33°C*

−28
+18
−23
───
−33

10 An ocean sensor is raised and lowered to different depths in the sea. Note that −100 metres means 100 metres below sea level.

a If the sensor is initially at −100 metres and then raised to −41 metres, how far does the sensor rise? *59 m*

b If the sensor is initially at −37 metres and then lowered to −93 metres, how far is the sensor lowered? *→ 56 m*

11 Give an example that suits the description.

a A positive number subtract a positive number equals a negative number. *3 − 4 = −1*

b A negative number subtract a positive number equals a negative number. *−2 − 1 = −3*

c A negative number add a positive number equals a positive number. *−2 + 3 = 1*

d A negative number add a positive number equals a negative number. *−3 + 1 = −2*

12 a a is a positive integer, b is a positive integer and $a > b$. For each of the following, decide if the result will be positive, negative or zero.

   i $a + b$ *>0*   **ii** $a - b$ *>0*   **iii** $b - a$ *<0*   **iv** $a - a$ *=0*

b a is a negative integer and b is a positive integer. Decide if each of the following is *always* true.

   i $a + b$ is positive *not always true*   **ii** $a - b$ is negative *always true*

13 Insert + or − signs into these statements to make them true.

a $3 \boxed{-} 4 \boxed{+} 5 = 4$ **b** $1 \boxed{+} 7 \boxed{-} 9 \boxed{-} 4 = -5$

c $-4 \boxed{-} 2 \boxed{-} 1 \boxed{+} 3 \boxed{+} 4 = 0$ **d** $-20 \boxed{+} 10 \boxed{+} 7 \boxed{+} 36 \boxed{+} 1 \boxed{-} 18 = -4$

e $-a \boxed{-} b \boxed{+} a \boxed{+} b = 0$ **f** $-a \boxed{-} a \boxed{+} 3a \boxed{-} b \boxed{-} b = a - 2b$

1   Write down the missing numbers in these sentences. The first one has been done for you

    a   2 + 5 means that 5 is added to 2.

    b   −3 + 6 means that $\boxed{6}$ is added to $\boxed{-3}$.

    c   1 + (−3) means that $\boxed{-3}$ is added to $\boxed{1}$.

    d   −7 + (−11) means that $\boxed{-11}$ is added to $\boxed{-7}$.

    e   5 − 3 means that $\boxed{3}$ is subtracted from $\boxed{5}$.

    f   −2 − 6 means that $\boxed{+6}$ is subtracted from $\boxed{-2}$.

    g   7 − (−3) means that $\boxed{-3}$ is subtracted from $\boxed{7}$.

    h   −7 − (−11) means that $\boxed{-11}$ is subtracted from $\boxed{-7}$.

2   Complete these sentences.

    a   Adding −4 is equivalent to subtracting $\boxed{4}$.

    b   Adding −6 is equivalent to ___subtracting___ 6.

    c   Adding 5 is equivalent to subtracting $\boxed{-5}$.

    d   Adding −11 is equivalent to ___subtracting___ 11.

    e   Subtracting −2 is equivalent to adding $\boxed{2}$.

    f   Subtracting −7 is equivalent to ___adding___ 7.

3   State whether each of the following is true or false.

    a   2 + (−3) = 5 **F** b   10 + (−1) = 9 **T** c   −5 + (−3) = −8 **T** d   −6 + (−2) = −4 **F**

    e   5 − (−1) = 4 **F** f   3 − (−9) = 12 **T** g   2 − (−3) = 1 **F** h   −11 − (−12) = −1 **F**

4   Calculate the answer to each of these additions. Check your answer using a calculator.

    a   3 + (−2) = **1**   b   8 + (−3) = **5**   c   12 + (−6) = **6**   d   9 + (−7) = **2**

    e   1 + (−4) = **−3**   f   6 + (−11) = **−5** g   20 + (−22) = **−2** h   0 + (−4) = **−4**

5   Calculate the answer to each of these subtractions. Check your answer using a calculator.

    a   2 − (−3) = **5**   b   5 − (−6) = **11**   c   20 − (−30) = **50**   d   29 − (−61) = **90**

    e   −5 − (−1) = **−4**   f   −7 − (−4) = **−3** g   −11 − (−6) = **−5**   h   −41 − (−7) = **−34**

6   Find the missing number.

    a   2 + $\boxed{-3}$ = −1   b   3 + $\boxed{-10}$ = −7   c   −2 + $\boxed{-4}$ = −6   d $\boxed{4}$ + (−3) = 1

    e $\boxed{-1}$ + (−10) = −11 f $\boxed{4}$ + (−4) = 0   g   5 − $\boxed{-1}$ = 6   h   2 − $\boxed{-5}$ = 7

7 Calculate the answer, working from left to right.

a $3 + (-2) + (-1) = 0$ b $2 + (-1) + (-6) = -5$ c $3 - (-1) - (-4) = 8$

d $10 - (-6) + (-4) = 12$ e $-7 - (-1) + (-3) = -9$ f $-20 - (-10) - (-15) = 5$

g $-9 - (-19) + (-16) = -6$ h $-15 - (-20) + (-96) = -91$ i $-13 - (-19) + (-21) = -15$

j $-2 - (-3) - (-5) = 6$ k $-18 - (-16) - (-19) = 17$ l $5 + (-20) - (-26) = 11$

8 A diver is at a height of -90 metres from the surface of the sea. During a diving exercise, the diver rises 50 metres, falls 138 metres and then rises once again by 35 metres. What is the diver's final height from sea level?

$$-90$$
$$+50$$
$$-138$$
$$+35$$

$$-90 + 50 - 138 + 35 = -143$$

9 A small business has a bank balance of $-\$50\,000$. An amount of $\$20\,000$ of extra debt is added to the balance and, later, $\$35\,000$ is paid back. What is the final balance?

$$-50{,}000 - 20{,}000 + 35{,}000 = -35{,}000$$

10 $\$100$ of debt is added to an existing balance of $\$50$ of debt. Later, $\$120$ of debt is removed from the balance. What is the final balance?

$$50 + 100 - 120 = 30 \text{ of debt.}$$

11 Here is a profit graph showing the profit for each month of the first half of the year for a bakery shop.

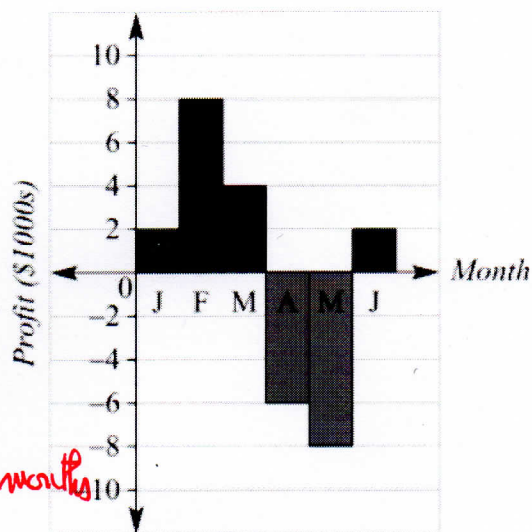a What is the profit for:

   i February? $\$8{,}000$

   ii April? $-\$6{,}000$

b What is the overall profit for the 6 months?

$$2 + 8 + 4 - 6 - 8 + 2 = 2$$

which is in thousands of $\$$

so $\$2{,}000$ profit for 6 months

12 Complete these magic squares, using addition. The sum of each row, column and diagonal should be the same.

a

−2	0	5
8	1	−6
−3	2	4

3

b

−13	−11	−6
−3	−10	−17
−14	−9	−7

11

−30