

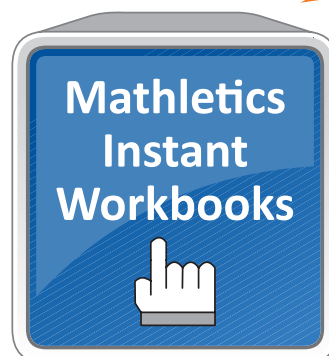
# MATHLETICS

*Inspiring Better Results*

## Directed Numbers

Student Book - Series H-2

$$+5 \times -3 = \underline{\hspace{2cm}}$$



# Directed numbers

## Student Book - Series H 2

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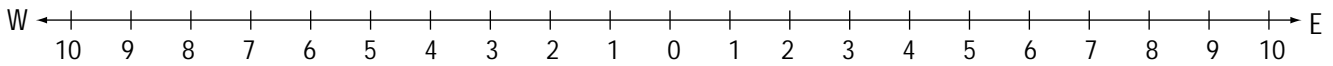
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Author of The Topics and Topic Tests: AS Kalra

# Directed numbers

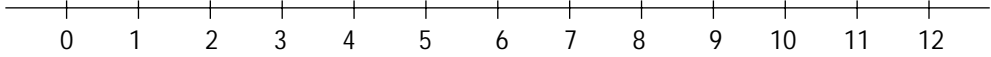
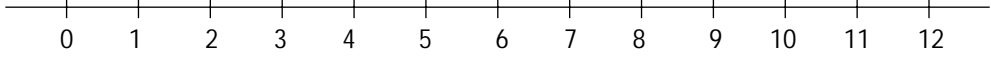
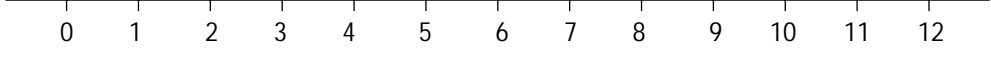
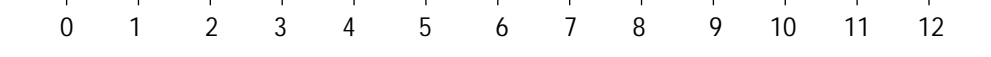
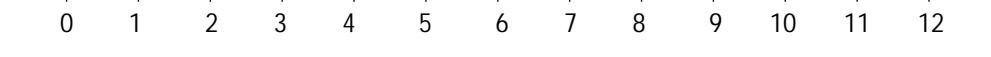
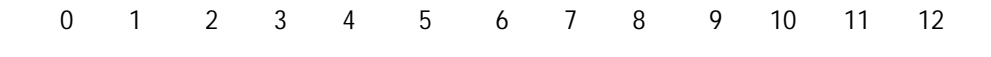
## Topic 1: Plotting on number lines

**QUESTION 1** Giving *distance* and *direction*, write where you would be from your starting point if you travelled on the east-west line.









- a 4 km west and then 7 km east \_\_\_\_\_
- b 6 km west and then 11 km east \_\_\_\_\_
- c 2 km west and then 8 km east \_\_\_\_\_
- d 6 km east and then 7 km west \_\_\_\_\_
- e 2 km east and then 5 km east \_\_\_\_\_
- f 3 km west and then 6 km west \_\_\_\_\_

**QUESTION 2** Plot the following sets of points on the number line.

- a {1, 3, 4, 6} 
- b {0, 2, 5, 7} 
- c {0, 2, 4, 6} 
- d {1, 3, 5, 7} 
- e {0, 1, 2, 3, 4} 
- f {1, 5, 6, 7, 9} 

**QUESTION 3** Graph each set of points on a separate number line.

- a the numbers from 3 to 7 
- b the numbers 1, 2, 5, 6, 8, 9 
- c odd numbers less than 10 
- d even numbers less than 10 
- e prime numbers less than 10 
- f the numbers 2, 3, 4, 8, 9, 10 

# Directed numbers

## Topic 2: Opposite directions — negative numbers

**QUESTION 1** What is the opposite of each of these statements?

- a going up \_\_\_\_\_      b going north \_\_\_\_\_  
c going east \_\_\_\_\_      d depositing money \_\_\_\_\_  
e winning \$50 \_\_\_\_\_      f five floors up \_\_\_\_\_  
g  $9^\circ$  below zero \_\_\_\_\_      h increase of 40 \_\_\_\_\_  
i 20 steps to the right \_\_\_\_\_      j 90 m above sea level \_\_\_\_\_

**QUESTION 2** For each of the following statements, write a directed number to show the size and direction of the number.

- a Michelle Russett deposited \$120 \_\_\_\_\_  
b Tim Eastman walked 40 km east \_\_\_\_\_  
c The price came down by \$20 \_\_\_\_\_  
d Maddy took 65 steps forwards \_\_\_\_\_  
e The water level dropped by 3 m \_\_\_\_\_  
f I lost 8 points \_\_\_\_\_

**QUESTION 3** Showing distance and direction, state where you would be from your starting point if you travelled:

- a 9 km east then 5 km west \_\_\_\_\_  
b 12 km west then 5 km east \_\_\_\_\_  
c 7 km north then 6 km south \_\_\_\_\_  
d 25 km east then 15 km west \_\_\_\_\_  
e 8 km east, 12 km west and then 7 km east \_\_\_\_\_

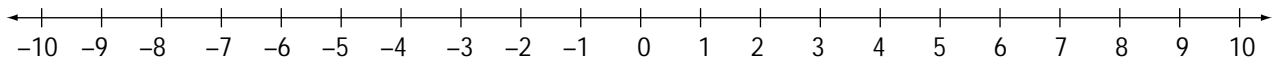
**QUESTION 4** Write a number sentence for each of the following.

- a A deposit of \$30 and a deposit of \$25 \_\_\_\_\_  
b A deposit of \$100 and a withdrawal of \$18 \_\_\_\_\_  
c A withdrawal of \$20 and a deposit of \$65 \_\_\_\_\_  
d A deposit of \$15 and a deposit of \$20 \_\_\_\_\_  
e A withdrawal of \$9 and a withdrawal of \$12 \_\_\_\_\_  
f A deposit of \$30 and a deposit of \$70 \_\_\_\_\_  
g A withdrawal of \$18 and a deposit of \$30 \_\_\_\_\_  
h A deposit of \$55 and a deposit of \$17 \_\_\_\_\_  
i A deposit of \$83 and a withdrawal of \$28 \_\_\_\_\_  
j A withdrawal of \$50 and a withdrawal of \$60 \_\_\_\_\_

# Directed numbers

## Topic 3: Extending the number line

Use the number line to answer the following questions.



**QUESTION 1** Represent each of the following trips on the number line using a directed number (a positive or negative number).

- |   |           |       |   |           |       |
|---|-----------|-------|---|-----------|-------|
| a | 0 to +7   | _____ | b | +1 to +8  | _____ |
| c | -8 to +3  | _____ | d | +3 to +9  | _____ |
| e | -2 to +5  | _____ | f | -1 to +10 | _____ |
| g | +6 to +10 | _____ | h | -8 to -1  | _____ |
| i | -7 to -3  | _____ | j | -9 to +5  | _____ |

**QUESTION 2** Which is the smaller number?

- |   |           |       |   |          |       |   |          |       |   |           |       |
|---|-----------|-------|---|----------|-------|---|----------|-------|---|-----------|-------|
| a | +10 or +6 | _____ | b | +8 or -1 | _____ | c | -8 or -2 | _____ | d | -2 or +2  | _____ |
| e | +6 or +1  | _____ | f | -7 or -5 | _____ | g | -3 or +7 | _____ | h | +10 or +8 | _____ |
| i | -6 or -1  | _____ | j | -4 or -2 | _____ | k | -6 or +7 | _____ | l | +8 or +9  | _____ |
| m | -8 or -1  | _____ | n | -7 or +2 | _____ | o | +2 or +8 | _____ |   |           |       |

**QUESTION 3** Use the number line to complete the following.

- |   |            |       |   |            |       |   |            |       |
|---|------------|-------|---|------------|-------|---|------------|-------|
| a | $5 - 8 =$  | _____ | b | $4 + 7 =$  | _____ | c | $6 + 3 =$  | _____ |
| d | $3 + 4 =$  | _____ | e | $9 - 2 =$  | _____ | f | $8 - 2 =$  | _____ |
| g | $-2 + 7 =$ | _____ | h | $7 - 3 =$  | _____ | i | $5 - 9 =$  | _____ |
| j | $4 - 8 =$  | _____ | k | $8 - 10 =$ | _____ | l | $-3 - 4 =$ | _____ |

**QUESTION 4** Arrange in descending order.

- |   |                        |       |
|---|------------------------|-------|
| a | +2, +4, -2, -7, -9, -1 | _____ |
| b | -2, -8, -6, -9, 3, 5   | _____ |
| c | 8, 9, 3, 1, 2, -4      | _____ |
| d | -3, -5, 2, 6, 3, -1    | _____ |
| e | 2, 5, 8 -4, -2, -6     | _____ |

**QUESTION 5** Write > or < to make the following statements true.

- |   |                 |   |                 |   |                 |
|---|-----------------|---|-----------------|---|-----------------|
| a | $8$ _____ $-5$  | b | $4$ _____ $-8$  | c | $3$ _____ $-5$  |
| d | $6$ _____ $9$   | e | $-5$ _____ $5$  | f | $4$ _____ $-9$  |
| g | $-6$ _____ $2$  | h | $-2$ _____ $2$  | i | $8$ _____ $10$  |
| j | $9$ _____ $-4$  | k | $-7$ _____ $+3$ | l | $-2$ _____ $-7$ |
| m | $-8$ _____ $-6$ | n | $-3$ _____ $+2$ | o | $-1$ _____ $6$  |

# Directed numbers

## Topic 4: Addition of directed numbers

**QUESTION 1** Find the sum of the following. Use the number line if necessary.

|                     |                     |                     |
|---------------------|---------------------|---------------------|
| a $+4 + +9 =$ _____ | b $+1 + +2 =$ _____ | c $+1 + +7 =$ _____ |
| d $+6 + +2 =$ _____ | e $+3 + +6 =$ _____ | f $+2 + +9 =$ _____ |
| g $+8 + +3 =$ _____ | h $+2 + +4 =$ _____ | i $+4 + +7 =$ _____ |

**QUESTION 2** Find each sum.

|                     |                      |                     |
|---------------------|----------------------|---------------------|
| a $+1 + -1 =$ _____ | b $+3 + -8 =$ _____  | c $+5 + -9 =$ _____ |
| d $+2 + -3 =$ _____ | e $+9 + -5 =$ _____  | f $+8 + -6 =$ _____ |
| g $+4 + -2 =$ _____ | h $+10 + -4 =$ _____ | i $+7 + -7 =$ _____ |

**QUESTION 3** Add the following.

|                      |                       |                       |
|----------------------|-----------------------|-----------------------|
| a $-9 + +1 =$ _____  | b $-18 + +6 =$ _____  | c $-15 + +11 =$ _____ |
| d $-10 + +3 =$ _____ | e $-24 + +7 =$ _____  | f $-17 + +4 =$ _____  |
| g $-12 + +5 =$ _____ | h $-28 + +10 =$ _____ | i $-7 + +15 =$ _____  |

**QUESTION 4** Find the answers to these additions.

|                       |                      |                      |
|-----------------------|----------------------|----------------------|
| a $-2 + -3 =$ _____   | b $-7 + -1 =$ _____  | c $-1 + -7 =$ _____  |
| d $-5 + -9 =$ _____   | e $-3 + -2 =$ _____  | f $-10 + -5 =$ _____ |
| g $-9 + -4 =$ _____   | h $-8 + -10 =$ _____ | i $-4 + -8 =$ _____  |
| j $-12 + -17 =$ _____ | k $-6 + -14 =$ _____ | l $-11 + -6 =$ _____ |

**QUESTION 5** Find the values of the following.

|                           |                           |                           |
|---------------------------|---------------------------|---------------------------|
| a $+6 + +2 + +5 =$ _____  | b $+17 + -3 + -2 =$ _____ | c $+10 + +2 + -3 =$ _____ |
| d $-18 + +8 =$ _____      | e $-8 + -6 =$ _____       | f $-20 + -5 =$ _____      |
| g $+7 + -4 + -1 =$ _____  | h $-14 + +3 + +8 =$ _____ | i $-9 + -6 =$ _____       |
| j $+10 + -5 + -3 =$ _____ | k $+15 + -8 + -3 =$ _____ | l $-8 + +4 =$ _____       |

**QUESTION 6** Find the missing number.

|                           |                          |                        |
|---------------------------|--------------------------|------------------------|
| a $+4 +$ _____ $= +2$     | b _____ $+ -5 = 0$       | c $+10 + -3 =$ _____   |
| d $+8 +$ _____ $= +6$     | e $+5 + -9 + -2 =$ _____ | f $-7 + -8 =$ _____    |
| g $+9 + -6 =$ _____       | h $+8 + +4 =$ _____      | i $-4 +$ _____ $= -13$ |
| j $-10 +$ _____ $= -21$   | k $-3 + -4 + -2 =$ _____ | l $+15 + +6 =$ _____   |
| m $+15 + -3 + -4 =$ _____ | n $-5 +$ _____ $= -14$   | o $-4 +$ _____ $= -18$ |

# Directed numbers

## Topic 5: Subtraction of directed numbers

**QUESTION 1** Find the answers to the following questions.

- |                     |                      |                      |
|---------------------|----------------------|----------------------|
| a $8 - 5 =$ _____   | b $10 - 7 =$ _____   | c $25 - 18 =$ _____  |
| d $+6 - +4 =$ _____ | e $+14 - +2 =$ _____ | f $+35 - +8 =$ _____ |
| g $+5 - +2 =$ _____ | h $+18 - +3 =$ _____ | i $+12 - +1 =$ _____ |
| j $+9 - +3 =$ _____ | k $+31 - +6 =$ _____ | l $+18 - +8 =$ _____ |

**QUESTION 2** Complete these subtractions. Use the number line if necessary.

- |                      |                       |                       |
|----------------------|-----------------------|-----------------------|
| a $+6 - -2 =$ _____  | b $+18 - -6 =$ _____  | c $+27 - -10 =$ _____ |
| d $+10 - -3 =$ _____ | e $+25 - -12 =$ _____ | f $+14 - -7 =$ _____  |
| g $+11 - -4 =$ _____ | h $+9 - -11 =$ _____  | i $+19 - -9 =$ _____  |
| j $+15 - -5 =$ _____ | k $+8 - -8 =$ _____   | l $+32 - -13 =$ _____ |

**QUESTION 3** Find each difference.

- |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| a $-20 - +2 =$ _____  | b $-8 - +6 =$ _____   | c $-7 - +12 =$ _____  |
| d $-10 - +8 =$ _____  | e $-16 - +9 =$ _____  | f $-17 - +4 =$ _____  |
| g $-15 - +10 =$ _____ | h $-12 - +3 =$ _____  | i $-27 - +7 =$ _____  |
| j $-5 - +5 =$ _____   | k $-24 - +13 =$ _____ | l $-38 - +11 =$ _____ |

**QUESTION 4** Find the answers to the following subtractions.

- |                      |                      |                      |
|----------------------|----------------------|----------------------|
| a $-3 - -1 =$ _____  | b $-2 - -5 =$ _____  | c $-13 - -8 =$ _____ |
| d $-5 - -6 =$ _____  | e $-8 - -2 =$ _____  | f $-6 - -3 =$ _____  |
| g $-7 - -10 =$ _____ | h $-12 - -7 =$ _____ | i $-15 - -9 =$ _____ |
| j $-9 - -12 =$ _____ | k $-11 - -4 =$ _____ | l $-4 - -11 =$ _____ |

**QUESTION 5** Find the values of the following.

- |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| a $-1 - -3 =$ _____   | b $-34 - +23 =$ _____ | c $-88 - +35 =$ _____ |
| d $-12 - -7 =$ _____  | e $+45 - -19 =$ _____ | f $-91 - -31 =$ _____ |
| g $-23 - +11 =$ _____ | h $-56 - -27 =$ _____ | i $+14 - -39 =$ _____ |
| j $-36 - -15 =$ _____ | k $+67 - +43 =$ _____ | l $-19 - -47 =$ _____ |

**QUESTION 6** Simplify the following.

- |                        |                        |                       |
|------------------------|------------------------|-----------------------|
| a $9 - 4 =$ _____      | b $-23 - 10 =$ _____   | c $17 - 9 =$ _____    |
| d $-7 - (-6) =$ _____  | e $11 - (-14) =$ _____ | f $5 - (-12) =$ _____ |
| g $-11 - 8 =$ _____    | h $36 - (-6) =$ _____  | i $28 - 11 =$ _____   |
| j $-15 - (-9) =$ _____ | k $3 - 8 =$ _____      | l $2 - 17 =$ _____    |

# Directed numbers

## Topic 6: Multiplication of directed numbers

QUESTION 1 Multiply the following.

- a  $+5 \times +1 =$  \_\_\_\_\_      b  $+15 \times +8 =$  \_\_\_\_\_      c  $+14 \times +9 =$  \_\_\_\_\_  
d  $+12 \times +6 =$  \_\_\_\_\_      e  $+7 \times +2 =$  \_\_\_\_\_      f  $+18 \times +3 =$  \_\_\_\_\_  
g  $+11 \times +11 =$  \_\_\_\_\_      h  $+13 \times +5 =$  \_\_\_\_\_      i  $+9 \times +10 =$  \_\_\_\_\_  
j  $+16 \times +21 =$  \_\_\_\_\_      k  $+17 \times +7 =$  \_\_\_\_\_      l  $+21 \times +4 =$  \_\_\_\_\_

QUESTION 2 Work out the following.

- a  $+4 \times -2 =$  \_\_\_\_\_      b  $+1 \times -3 =$  \_\_\_\_\_      c  $+3 \times -15 =$  \_\_\_\_\_  
d  $+2 \times -9 =$  \_\_\_\_\_      e  $+5 \times -12 =$  \_\_\_\_\_      f  $+18 \times -5 =$  \_\_\_\_\_  
g  $+7 \times -6 =$  \_\_\_\_\_      h  $+8 \times -4 =$  \_\_\_\_\_      i  $+6 \times -8 =$  \_\_\_\_\_  
j  $+15 \times -7 =$  \_\_\_\_\_      k  $+10 \times -11 =$  \_\_\_\_\_      l  $+21 \times -5 =$  \_\_\_\_\_

QUESTION 3 Find the answers to the following.

- a  $-3 \times +10 =$  \_\_\_\_\_      b  $-6 \times +8 =$  \_\_\_\_\_      c  $-7 \times +9 =$  \_\_\_\_\_  
d  $-10 \times +15 =$  \_\_\_\_\_      e  $-2 \times +11 =$  \_\_\_\_\_      f  $-1 \times +12 =$  \_\_\_\_\_  
g  $-5 \times +13 =$  \_\_\_\_\_      h  $-11 \times +14 =$  \_\_\_\_\_      i  $-8 \times +15 =$  \_\_\_\_\_  
j  $-9 \times +6 =$  \_\_\_\_\_      k  $-4 \times +5 =$  \_\_\_\_\_      l  $-12 \times +7 =$  \_\_\_\_\_

QUESTION 4 Simplify.

- a  $-7 \times -10 =$  \_\_\_\_\_      b  $-1 \times -4 =$  \_\_\_\_\_      c  $-8 \times -14 =$  \_\_\_\_\_  
d  $-2 \times -11 =$  \_\_\_\_\_      e  $-9 \times -12 =$  \_\_\_\_\_      f  $-3 \times -13 =$  \_\_\_\_\_  
g  $-10 \times -2 =$  \_\_\_\_\_      h  $-4 \times -3 =$  \_\_\_\_\_      i  $-11 \times -5 =$  \_\_\_\_\_  
j  $-5 \times -6 =$  \_\_\_\_\_      k  $-12 \times -1 =$  \_\_\_\_\_      l  $-6 \times -7 =$  \_\_\_\_\_

QUESTION 5 Find each product.

- a  $+4 \times -3 =$  \_\_\_\_\_      b  $-10 \times -10 =$  \_\_\_\_\_      c  $-9 \times +6 =$  \_\_\_\_\_  
d  $-3 \times +5 =$  \_\_\_\_\_      e  $+12 \times +12 =$  \_\_\_\_\_      f  $-15 \times +5 =$  \_\_\_\_\_  
g  $+8 \times -6 =$  \_\_\_\_\_      h  $-11 \times -14 =$  \_\_\_\_\_      i  $+18 \times -4 =$  \_\_\_\_\_  
j  $-6 \times +8 =$  \_\_\_\_\_      k  $+8 \times -9 =$  \_\_\_\_\_      l  $-25 \times -7 =$  \_\_\_\_\_

QUESTION 6 Complete the following tables.

a

|          |    |    |     |
|----------|----|----|-----|
| $\times$ | +8 | -6 | +10 |
| +6       |    |    |     |
| -8       |    |    |     |
| +3       |    |    |     |

b

|          |    |    |    |
|----------|----|----|----|
| $\times$ | -8 | +9 | -5 |
| +4       |    |    |    |
| -2       |    |    |    |
| +5       |    |    |    |

c

|          |    |    |    |
|----------|----|----|----|
| $\times$ | +4 | -6 | +8 |
| -7       |    |    |    |
| +12      |    |    |    |
| -15      |    |    |    |



# Directed numbers

## Topic 7: Division of directed numbers

QUESTION 1 Divide the following.

|   |                       |   |                       |   |                       |
|---|-----------------------|---|-----------------------|---|-----------------------|
| a | $+10 \div +2 =$ _____ | b | $+25 \div +5 =$ _____ | c | $+14 \div +7 =$ _____ |
| d | $+12 \div +4 =$ _____ | e | $+27 \div +3 =$ _____ | f | $+8 \div +4 =$ _____  |
| g | $+36 \div +6 =$ _____ | h | $+38 \div +2 =$ _____ | i | $+9 \div +3 =$ _____  |
| j | $+18 \div +9 =$ _____ | k | $+64 \div +8 =$ _____ | l | $+26 \div +2 =$ _____ |

QUESTION 2 Work out the following divisions.

|   |                       |   |                        |   |                        |
|---|-----------------------|---|------------------------|---|------------------------|
| a | $+6 \div -2 =$ _____  | b | $+18 \div -9 =$ _____  | c | $+27 \div -9 =$ _____  |
| d | $+9 \div -3 =$ _____  | e | $+39 \div -3 =$ _____  | f | $+21 \div -7 =$ _____  |
| g | $+12 \div -4 =$ _____ | h | $+24 \div -8 =$ _____  | i | $+33 \div -11 =$ _____ |
| j | $+15 \div -5 =$ _____ | k | $+30 \div -15 =$ _____ | l | $+36 \div -4 =$ _____  |

QUESTION 3 Simplify the following.

|   |                        |   |                       |   |                       |
|---|------------------------|---|-----------------------|---|-----------------------|
| a | $-15 \div +3 =$ _____  | b | $-36 \div +9 =$ _____ | c | $-42 \div +6 =$ _____ |
| d | $-21 \div +7 =$ _____  | e | $-48 \div +8 =$ _____ | f | $-35 \div +5 =$ _____ |
| g | $-24 \div +8 =$ _____  | h | $-64 \div +4 =$ _____ | i | $-26 \div +2 =$ _____ |
| j | $-30 \div +10 =$ _____ | k | $-56 \div +7 =$ _____ | l | $-18 \div +9 =$ _____ |

QUESTION 4 If  $a = 5$ ,  $b = 3$ ,  $c = 6$  and  $d = 10$ , find the value of each of the following.

|   |                      |   |                      |   |                        |
|---|----------------------|---|----------------------|---|------------------------|
| a | $a \div b =$ _____   | b | $c^2 \div d =$ _____ | c | $ac \div d =$ _____    |
| d | $c \div d =$ _____   | e | $a^2 + b^2 =$ _____  | f | $c^2 \div b^2 =$ _____ |
| g | $a^2 \div b =$ _____ | h | $d \div ab =$ _____  | i | $d \div c =$ _____     |
| j | $d^2 \div a =$ _____ | k | $bd \div ac =$ _____ | l | $cd \div ab =$ _____   |

QUESTION 5 Fill in the missing number.

|   |                         |   |                         |   |                         |
|---|-------------------------|---|-------------------------|---|-------------------------|
| a | $-60 \div$ _____ $= -6$ | b | $-144 \div +12 =$ _____ | c | $-12 \div +4 =$ _____   |
| d | _____ $\div -4 = +9$    | e | $+48 \div$ _____ $= -6$ | f | _____ $\div -7 = +7$    |
| g | $-64 \div -16 =$ _____  | h | $-64 \div -4 =$ _____   | i | $-33 \div$ _____ $= -3$ |
| j | _____ $\div -7 = -6$    | k | $-63 \div$ _____ $= 7$  | l | $+28 \div$ _____ $= -7$ |

QUESTION 6 Simplify the following.

|   |                       |   |                        |   |                       |
|---|-----------------------|---|------------------------|---|-----------------------|
| a | $+38 \div -2 =$ _____ | b | $+48 \div +8 =$ _____  | c | $+81 \div -9 =$ _____ |
| d | $-46 \div +2 =$ _____ | e | $-25 \div -5 =$ _____  | f | $-74 \div +2 =$ _____ |
| g | $-68 \div -4 =$ _____ | h | $+35 \div +7 =$ _____  | i | $+68 \div -2 =$ _____ |
| j | $+72 \div -9 =$ _____ | k | $-66 \div -11 =$ _____ | l | $+56 \div +7 =$ _____ |

# Directed numbers

## Topic 8: The four operations with directed numbers

QUESTION 1 Find the answers to the following.

- a  $7 + -8 =$  \_\_\_\_\_      b  $36 + +3 =$  \_\_\_\_\_      c  $18 - -4 =$  \_\_\_\_\_  
d  $-9 - +5 =$  \_\_\_\_\_      e  $45 + -1 =$  \_\_\_\_\_      f  $-24 - -6 =$  \_\_\_\_\_  
g  $10 + -7 =$  \_\_\_\_\_      h  $-54 - +2 =$  \_\_\_\_\_      i  $36 + +7 =$  \_\_\_\_\_  
j  $-21 - +6 =$  \_\_\_\_\_      k  $-9 - -3 =$  \_\_\_\_\_      l  $-48 + +8 =$  \_\_\_\_\_

QUESTION 2 Find the value of the following.

- a  $-28 \div -4 =$  \_\_\_\_\_      b  $+36 \div -4 =$  \_\_\_\_\_      c  $-72 \div -4 =$  \_\_\_\_\_  
d  $-15 + -3 =$  \_\_\_\_\_      e  $+25 - +6 =$  \_\_\_\_\_      f  $-42 - -12 =$  \_\_\_\_\_  
g  $+19 - -8 =$  \_\_\_\_\_      h  $+28 + -10 =$  \_\_\_\_\_      i  $-45 + +14 =$  \_\_\_\_\_  
j  $-29 + +7 =$  \_\_\_\_\_      k  $-32 - +9 =$  \_\_\_\_\_      l  $-64 - -15 =$  \_\_\_\_\_

QUESTION 3 Work out the following.

- a  $+63 \div -9 =$  \_\_\_\_\_      b  $-32 \times +2 =$  \_\_\_\_\_      c  $-42 \div -7 =$  \_\_\_\_\_  
d  $-56 \div -7 =$  \_\_\_\_\_      e  $-48 \div -8 =$  \_\_\_\_\_      f  $+20 \times +5 =$  \_\_\_\_\_  
g  $+28 \div +4 =$  \_\_\_\_\_      h  $+81 \div -9 =$  \_\_\_\_\_      i  $-10 \times -6 =$  \_\_\_\_\_  
j  $-24 \times -3 =$  \_\_\_\_\_      k  $+96 \div -6 =$  \_\_\_\_\_      l  $-8 \times +9 =$  \_\_\_\_\_

QUESTION 4 Simplify the following.

- a  $(+5 \times +4) \times -2 =$  \_\_\_\_\_      b  $+10 - +4 \times -5 =$  \_\_\_\_\_      c  $-6 + -5 + -8 =$  \_\_\_\_\_  
d  $(-3 \times -2) \times -5 =$  \_\_\_\_\_      e  $-64 \div -8 \times +3 =$  \_\_\_\_\_      f  $16 \div (-6 + 2) =$  \_\_\_\_\_  
g  $24 \div (-3 \times -2) =$  \_\_\_\_\_      h  $(-6 - 6) \times -5 =$  \_\_\_\_\_      i  $30 \times (15 \div 5) =$  \_\_\_\_\_  
j  $(+8 \times -3) \div -4 =$  \_\_\_\_\_      k  $-300 \div -50 \times 2 =$  \_\_\_\_\_      l  $(-8 - 4) \div 6 =$  \_\_\_\_\_

QUESTION 5 Fill in the missing number.

- a  $+72 \div -9 =$  \_\_\_\_\_      b \_\_\_\_\_  $\div 2 = -12$       c  $+24 -$  \_\_\_\_\_  $= +18$   
d  $+9 \times -6 =$  \_\_\_\_\_      e \_\_\_\_\_  $\div +9 = -6$       f  $-10 -$  \_\_\_\_\_  $= -7$   
g  $+8 + -7 =$  \_\_\_\_\_      h  $+15 + -6 =$  \_\_\_\_\_      i  $+8 \times$  \_\_\_\_\_  $= -80$   
j  $-6 - -3 =$  \_\_\_\_\_      k  $-18 - -5 =$  \_\_\_\_\_      l  $-9 +$  \_\_\_\_\_  $= -15$

QUESTION 6 Complete the tables.

a

|          |    |    |     |     |    |    |
|----------|----|----|-----|-----|----|----|
| $\times$ | +6 | -8 | +10 | -12 | -3 | +5 |
| -3       |    |    |     |     |    |    |
| 5        |    |    |     |     |    |    |
| -9       |    |    |     |     |    |    |

b

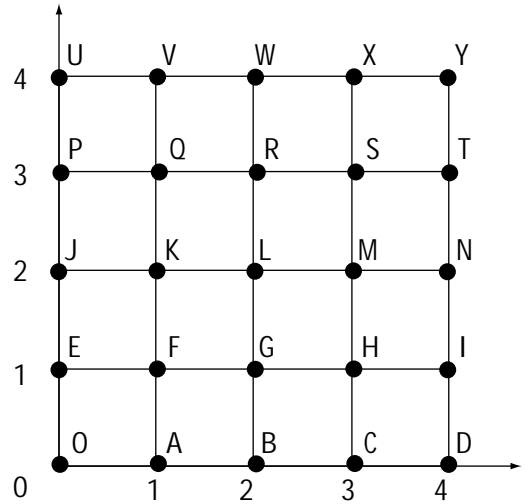
|          |    |    |    |    |    |    |
|----------|----|----|----|----|----|----|
| $\times$ | -5 | -3 | +2 | +6 | -8 | +9 |
| +4       |    |    |    |    |    |    |
| -8       |    |    |    |    |    |    |
| +7       |    |    |    |    |    |    |

# Directed numbers

## Topic 9: The number plane

**QUESTION 1** Write the letter used to name the following points.

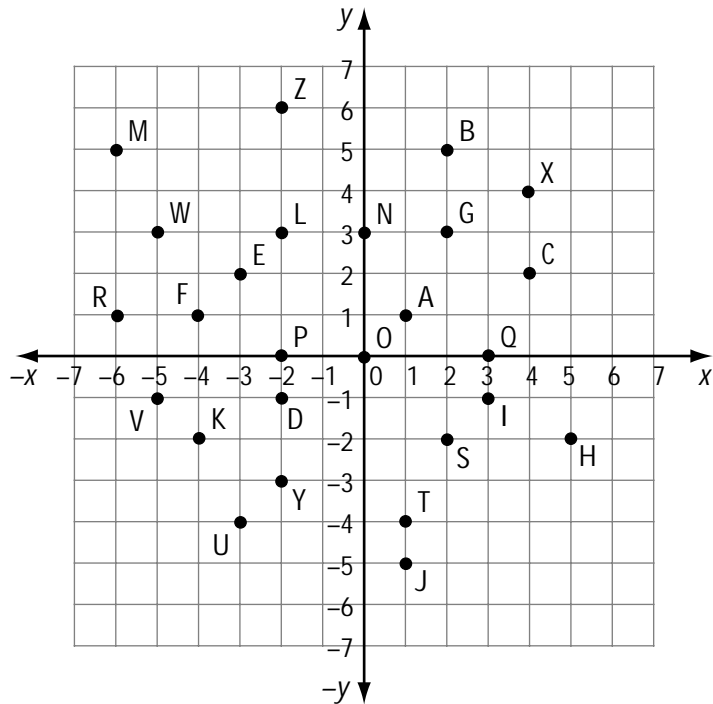
- |   |              |   |              |
|---|--------------|---|--------------|
| a | (0, 0) _____ | b | (1, 1) _____ |
| c | (2, 2) _____ | d | (3, 3) _____ |
| e | (4, 4) _____ | f | (0, 1) _____ |
| g | (0, 2) _____ | h | (0, 3) _____ |
| i | (0, 4) _____ | j | (1, 0) _____ |
| k | (2, 0) _____ | l | (3, 0) _____ |
| m | (4, 0) _____ | n | (2, 1) _____ |
| o | (2, 3) _____ | p | (2, 4) _____ |
| q | (1, 2) _____ | r | (1, 3) _____ |
| s | (1, 4) _____ | t | (3, 1) _____ |
| u | (3, 2) _____ | v | (3, 4) _____ |



- |   |              |   |              |
|---|--------------|---|--------------|
| w | (4, 1) _____ | x | (4, 2) _____ |
|---|--------------|---|--------------|

**QUESTION 2** Write down the coordinates of the following points shown in the number plane.

- |   |         |
|---|---------|
| a | A _____ |
| b | B _____ |
| c | C _____ |
| d | D _____ |
| e | E _____ |
| f | F _____ |
| g | G _____ |
| h | H _____ |
| i | I _____ |
| j | J _____ |
| k | K _____ |
| l | L _____ |
| m | M _____ |
| n | N _____ |
| o | O _____ |
| p | P _____ |
| q | Q _____ |
| u | U _____ |
| y | Y _____ |



- |   |         |   |         |   |         |
|---|---------|---|---------|---|---------|
| r | R _____ | s | S _____ | t | T _____ |
| v | V _____ | w | W _____ | x | X _____ |
| z | Z _____ |   |         |   |         |

# Directed numbers

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## Topic 10: Problem solving with directed numbers

- 1** Where would I be after a trip of 5 km south, followed by a trip of 9 km north?  
\_\_\_\_\_
- 2** What would be the net result of a deposit of \$700 in my account followed by a withdrawal of \$900?  
\_\_\_\_\_
- 3** Two numbers have a product of 56 and their sum of  $-15$ . What are the numbers?  
\_\_\_\_\_
- 4** If the sum of two numbers is  $-2$  and their product is  $-24$ , find the numbers?  
\_\_\_\_\_
- 5** I am a negative number divisible by 7 and greater than  $-9$ . What number am I?  
\_\_\_\_\_
- 6** Find the sum of a profit of \$9000 and a loss of \$21 000.  
\_\_\_\_\_
- 7** The temperature fell  $5^\circ$  during the day and fell another  $5^\circ$  during the night. What was the total change in temperature?  
\_\_\_\_\_
- 8** What is the combined effect of a gain of 8 kg and a loss of 7 kg?  
\_\_\_\_\_
- 9** Find the two integers whose sum is  $-11$  and product is 30.  
\_\_\_\_\_
- 10** Start with the integer 5, add 7 and multiply the result by  $-3$ . What is the answer?  
\_\_\_\_\_
- 11** If 6 more than  $-4$  is added to the product of 5 and 9, what is the result?  
\_\_\_\_\_
- 12** Divide  $-72$  by  $-9$  and multiply the result by  $-5$ . What is the answer?  
\_\_\_\_\_
- 13** Which of the integers  $-9, -5, -2, -1, 3, 7$  is closest to zero?  
\_\_\_\_\_
- 14** From the integers  $-7, -5, -3, 4, 9$ , find the three integers whose sum is  $-1$ .  
\_\_\_\_\_
- 15** Multiply 8 by  $-12$  and add 6 to the result. What is the answer?  
\_\_\_\_\_

# Directed numbers

## Topic Test

## PART A

**Instructions** This part consists of 12 multiple-choice questions  
Each question is worth 1 mark  
Fill in only ONE CIRCLE for each question  
Calculators are NOT allowed

**Time allowed: 15 minutes**

**Total marks = 12**

|           |  |                               |                               | Marks                         |                               |                                |
|-----------|--|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|
| <b>1</b>  | $-16 + +4$ equals                              | <input type="radio"/> (A) -12 | <input type="radio"/> (B) -20 | <input type="radio"/> (C) 12  | <input type="radio"/> (D) 20  | <input type="text" value="1"/> |
| <b>2</b>  | $-9 + -2 + -1$ equals                          | <input type="radio"/> (A) -12 | <input type="radio"/> (B) 12  | <input type="radio"/> (C) -11 | <input type="radio"/> (D) -10 | <input type="text" value="1"/> |
| <b>3</b>  | $+8 - -5$ equals                               | <input type="radio"/> (A) 3   | <input type="radio"/> (B) 13  | <input type="radio"/> (C) -3  | <input type="radio"/> (D) -13 | <input type="text" value="1"/> |
| <b>4</b>  | $(-3)^2$ equals                                | <input type="radio"/> (A) -9  | <input type="radio"/> (B) 9   | <input type="radio"/> (C) -6  | <input type="radio"/> (D) 6   | <input type="text" value="1"/> |
| <b>5</b>  | $-12 - - 12$ equals                            | <input type="radio"/> (A) 24  | <input type="radio"/> (B) -24 | <input type="radio"/> (C) 0   | <input type="radio"/> (D) 144 | <input type="text" value="1"/> |
| <b>6</b>  | $(-7 \times 5) + 9$ equals                     | <input type="radio"/> (A) -26 | <input type="radio"/> (B) 26  | <input type="radio"/> (C) -18 | <input type="radio"/> (D) 18  | <input type="text" value="1"/> |
| <b>7</b>  | $-7 - (8 - -2)$ equals                         | <input type="radio"/> (A) 3   | <input type="radio"/> (B) -3  | <input type="radio"/> (C) -17 | <input type="radio"/> (D) 17  | <input type="text" value="1"/> |
| <b>8</b>  | $-10 + -4 \times -5$ equals                    | <input type="radio"/> (A) -10 | <input type="radio"/> (B) 10  | <input type="radio"/> (C) -30 | <input type="radio"/> (D) 30  | <input type="text" value="1"/> |
| <b>9</b>  | If $a = 5$ and $b = 4$ then $(a - b)^2$ equals | <input type="radio"/> (A) 81  | <input type="radio"/> (B) 25  | <input type="radio"/> (C) 16  | <input type="radio"/> (D) 1   | <input type="text" value="1"/> |
| <b>10</b> | If $x = 3$ and $y = -8$ then $xy + 7$ equals   | <input type="radio"/> (A) 17  | <input type="radio"/> (B) -17 | <input type="radio"/> (C) 31  | <input type="radio"/> (D) -31 | <input type="text" value="1"/> |

# Directed numbers

## Topic Test

## PART A continued

|  |                                  |     |    | Marks |     |     |     |    |
|--|----------------------------------|-----|----|-------|-----|-----|-----|----|
| <b>11</b>                              | $-9 \times -6 \div -2$ equals    |     |    |       |     |     |     |    |
| (A)                                    | -27                              | (B) | 27 | (C)   | -54 | (D) | 54  | 1  |
| <b>12</b>                              | $+48 + +10 - -2$ equals          |     |    |       |     |     |     |    |
| (A)                                    | 58                               | (B) | 60 | (C)   | 56  | (D) | 62  | 1  |
| <b>13</b>                              | $-64 \div +16 - -3$ equals       |     |    |       |     |     |     |    |
| (A)                                    | -7                               | (B) | +1 | (C)   | -1  | (D) | 7   | 1  |
| <b>14</b>                              | $(-8 \times -4) \div -16$ equals |     |    |       |     |     |     |    |
| (A)                                    | 2                                | (B) | -2 | (C)   | 16  | (D) | -16 | 1  |
| <b>15</b>                              | $-15 - (9 - -1)$ equals          |     |    |       |     |     |     |    |
| (A)                                    | -25                              | (B) | 25 | (C)   | -6  | (D) | 6   | 1  |
| <b>Total marks achieved for PART A</b> |                                  |     |    |       |     |     |     | 15 |

# Directed numbers

## Topic Test

## PART B

**Instructions** This part consists of 15 questions  
Each question is worth 1 mark  
Write answers in the answers-only column

**Time allowed: 20 minutes**

**Total marks = 15**

| Questions                               | Answers only | Marks |
|---|--------------|-------|
| <b>1</b> $18 \div -6 =$                 |              | 1     |
| <b>2</b> $5 - -12 =$                    |              | 1     |
| <b>3</b> $(-7)^2 =$                     |              | 1     |
| <b>4</b> $-8 - 10 =$                    |              | 1     |
| <b>5</b> $15 - 8 \times 4 =$            |              | 1     |
| <b>6</b> $-36 \div -9 =$                |              | 1     |
| <b>7</b> $-8 \times (5 - 9) =$          |              | 1     |
| <b>8</b> $5 - 8\frac{1}{2} =$           |              | 1     |
| <b>9</b> $(-6 - -15) \times (8 - 12) =$ |              | 1     |
| <b>10</b> $-36 \div 9 \div -4 =$        |              | 1     |
| <b>11</b> $(-3)^2 \times (5 - 12) =$    |              | 1     |
| <b>12</b> $\frac{-6 - -18}{5 - 7} =$    |              | 1     |
| <b>13</b> $8 \times -2 - (6 - 11) =$    |              | 1     |
| <b>14</b> $1 + -15 =$                   |              | 1     |
| <b>15</b> $5 - -12 + 8 \times -3 =$     |              | 1     |

**Total marks achieved for PART B**

15

# Directed numbers

## Topic Test

## PART C

**Instructions** This part consists of 4 questions  
Each question is worth 5 marks  
Show all necessary

**Time allowed: 20 minutes**

**Total marks = 20**

| Questions  | Marks    |
|--|----------|
| <p><b>1</b> Evaluate the following.</p> <p>a <math>-8 \times -5 \times -2 =</math> _____</p> <p>b <math>+8 + -7 + -3 \times -4 =</math> _____</p> <p>c <math>-36 \div -9 + -8 =</math> _____</p> <p>d <math>(-9)^2 + (-12 \div 6) =</math> _____</p> <p>e <math>8 \times -6 - (7 - 8) =</math> _____</p>   | <b>5</b> |
| <p><b>2</b> Complete the number pattern.</p> <p>a <math>-3, -2, -1, 0,</math> _____ , _____ , _____</p> <p>b <math>-5, -3, -1, 1,</math> _____ , _____ , _____</p> <p>c <math>-2, -4, -6, -8,</math> _____ , _____ , _____</p> <p>d <math>3, -6, 12, -24,</math> _____ , _____ , _____</p> <p>e <math>32, -16, 8,</math> _____ , _____ , _____</p> | <b>5</b> |
| <p><b>3</b> Simplify the following.</p> <p>a <math>\frac{-8 + -10}{-6} =</math> _____</p> <p>b <math>\frac{-27 - 9}{-4} =</math> _____</p> <p>c <math>\frac{8 + (3 \times -5)}{7} =</math> _____</p> <p>d <math>\frac{-12 \times -6}{-15 + 7} =</math> _____</p> <p>e <math>\frac{5 - 53}{25 - 9} =</math> _____</p>                               | <b>5</b> |
| <p><b>4</b> Find the value of the following.</p> <p>a <math>[26 - (-4)] \times -3 =</math> _____</p> <p>b <math>[-8 - (-19)] \div 11 =</math> _____</p> <p>c <math>96 - (-5 \times 12) =</math> _____</p> <p>d <math>[(9 \times -6) - 3] \div -3 =</math> _____</p> <p>e <math>-9 + -12 \times -6 \div -3 =</math> _____</p>                       | <b>5</b> |

**Total marks achieved for PART C**

**20**