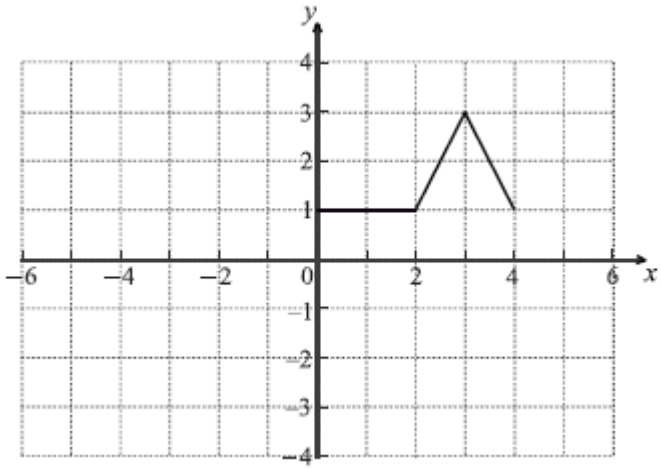
Transformations, Sequences, & Series (more practice)

1. Consider the graph of f shown below.



(a) On the **same** grid sketch the graph of $y = f(-x)$.

(2)

The following four diagrams show **images** of f under different transformations.

Diagram A

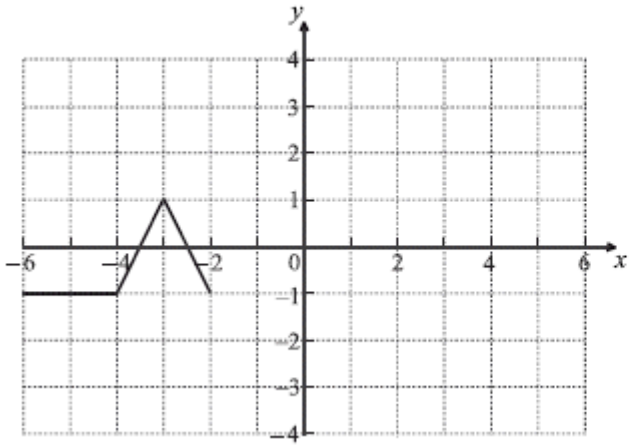


Diagram B

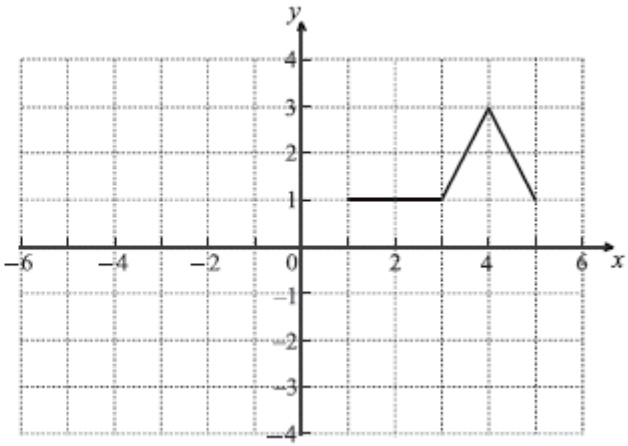


Diagram C

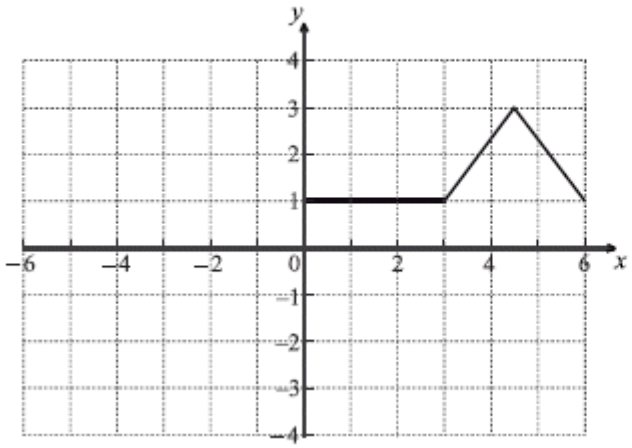
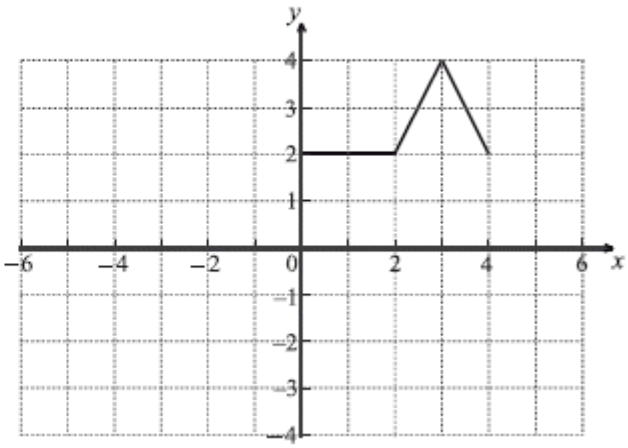


Diagram D



(b) Complete the following table.

Description of transformation	Diagram letter
Horizontal stretch with scale factor 1.5	
Maps f to $f(x) + 1$	

(2)

(c) Give a full geometric description of the transformation that gives the image in Diagram A.

(2)
(Total 6 marks)

2. An arithmetic series has five terms. The first term is 2 and the last term is 32. Find the sum of the series.

Working:

Answer:

.....

(Total 4 marks)

3. In an arithmetic sequence, the first term is –2, the fourth term is 16, and the n^{th} term is 11 998.

(a) Find the common difference *d*.

(b) Find the value of *n*.

Working:

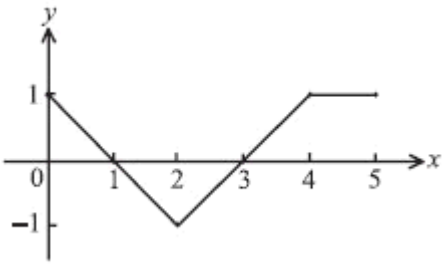
Answers:

(a) .....

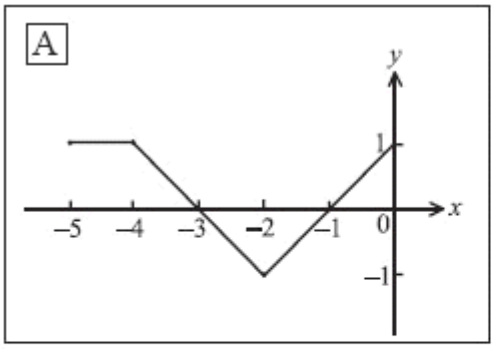
(b) .....

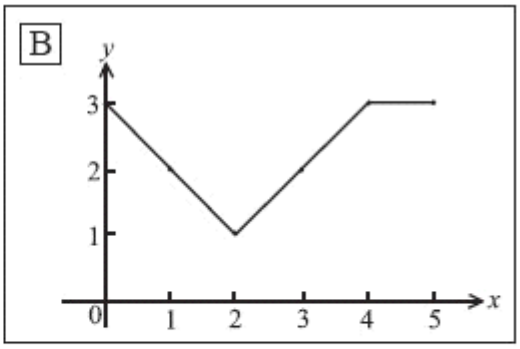
(Total 6 marks)

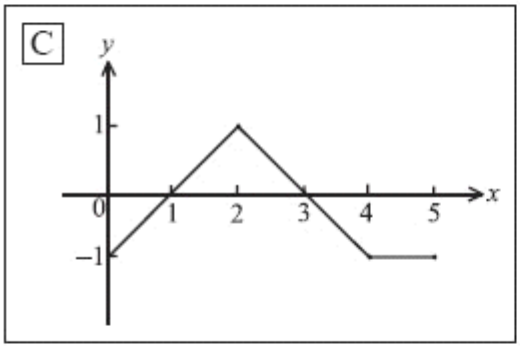
4. The following diagram shows part of the graph of $f(x)$.

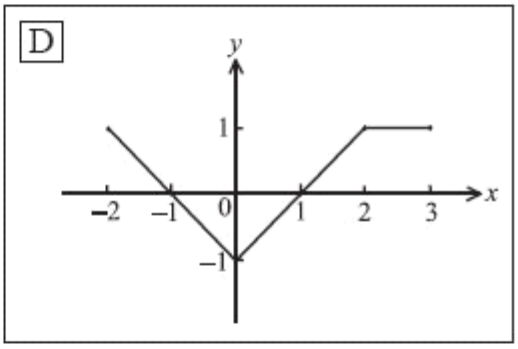


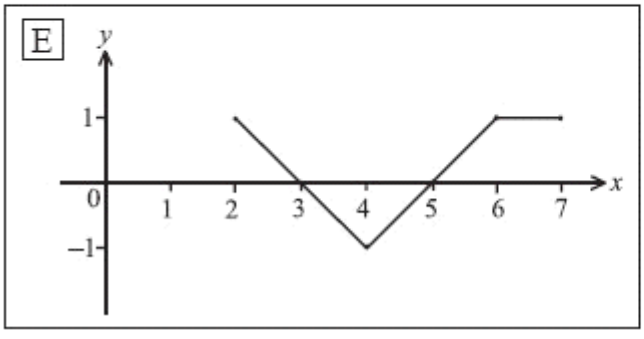
Consider the five graphs in the diagrams labelled A, B, C, D, E below.











(a) Which diagram is the graph of $f(x + 2)$?

(b) Which diagram is the graph of $-f(x)$?

(c) Which diagram is the graph of $f(-x)$

(Total 6 marks)

5. In an arithmetic sequence $u_1 = 7$, $u_{20} = 64$ and $u_n = 3709$.

(a) Find the value of the common difference.

(3)

(b) Find the value of n.

(2)
(Total 5 marks)

6. In an arithmetic sequence $u_{21} = -37$ and $u_4 = -3$.

(a) Find

(i) the common difference;

(ii) the first term.

(4)

(b) Find S_{10}.

(3)
(Total 7 marks)

7. Let S_n be the sum of the first n terms of an arithmetic sequence, whose first three terms are u_1, u_2 and u_3. It is known that $S_1 = 7$, and $S_2 = 18$.

(a) Write down u_1.

(b) Calculate the common difference of the sequence.

(c) Calculate u_4.

Working:

Answers:

(a) .....

(b) .....

(c) .....

(Total 6 marks)