



1 STARTER





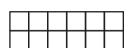


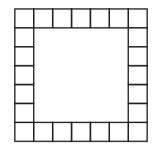
EXERCISE 1.4, Q1

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6				
2	2	4	6	8	10					
3	3	6	9	12						
4	4	8	12							
5	5	10								
6	6	12								
7	7	14								
8	8								72	
9	9							72		
10	10									



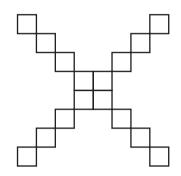
1



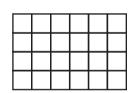


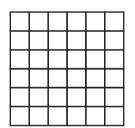
2





3





EXERCISE 3.6









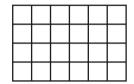


4 STARTER

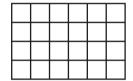
2 a) $\frac{1}{2}$



b) $\frac{1}{3}$



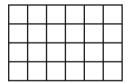
c) $\frac{3}{4}$



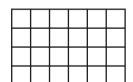
d) $\frac{1}{6}$

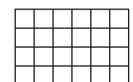


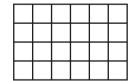
e) $\frac{3}{8}$



f) $\frac{5}{8}$

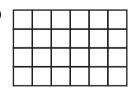




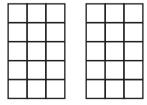


REVIEW EXERCISE 4

11 b)



12

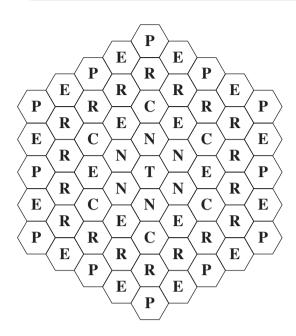


13 a) ii)









EXERCISE 5.1, Q6

Percentage	Decimal	Fraction
1%		
	0.1	
	0.125	
		$\frac{1}{5}$
25%		
33.33%		$\frac{1}{3}$
50%		
		$\frac{2}{3}$
75%		
	0.8	
90%		

REVIEW EXERCISE 5, Q9

Percentage	Decimal	Fraction
65%		
	0.95	
		$\frac{17}{20}$
62.5%		
	0.3%	
		$\frac{9}{40}$



25	on																								
24	on	off	on																						
23	on																								
22	on	off																							
21	on		off																						
20	on	off																							
19	on																								
18	on	off	on																						
17	on)																							
16	on	off																							
15 1	on	0	off																						
		Ef.	0																						
3 14	ι on	off																							
13	lo	Ę																							
12	on	off	on																						
11	on																								
10	on	off																							
6	on		off																						
∞	on	off																							
7	on																								
9	on	off	on																						
S.	on																								
4	on	off																							
В	on		off																						
7	on	off																							
1	on																								
Bulb		2	3	4	5	9	7	8	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
∠ ≃	<u> </u>																								

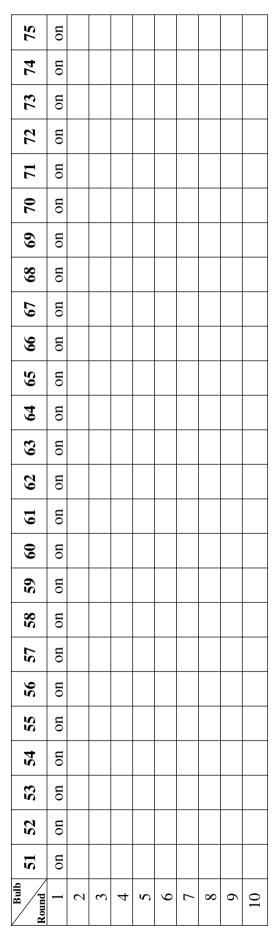
▶▶ 6 STARTER A

25	on									
24	on									
23	on									
22	on									
21	on									
20	on									
19	on									
18	on									
17	on									
16	on									
15	on									
14	on									
13	on									
12	on									
11	on									
10	on									
6	on									
8	on									
7	on									
9	on									
S	on									
4	on									
3	on									
2	on									
1	on									
Bulb	1	2	3	4	5	9	7	8	6	10

20	on									
49	on									
48	on									
47	on									
46	on									
45	on									
4	on									
43	on									
42	on									
41	on									
40	on									
39	on									
38	on									
37	on									
36	on									
35	on									
34	on									
33	on									
32	on									
31	on									
30	on									
29	on									
28	on									
27	on									
56	on									
Bulb	1	2	3	4	5	9	7	8	6	10







10(on									
99	on									
98	on									
97	on									
96	on									
95	on									
94	on									
93	on									
92	on									
91	on									
06	on									
80	on									
88	on									
87	on									
98	on									
82	on									
8	on									
83	on									
82	on									
81	on									
80	on									
79	on									
78	on									
77	on									
92	on									
Bulb Round	1	2	3	4	5	9	7	8	6	10

▶▶ 6 STARTER B (continued)



EXERCISE 6.1

4

2	3	4	5	6	7
8	9	10	11	12	13
14	15	16	17	18	19
20	21	22	23	24	25
26	27	28	29	30	31
32	33	34	35	36	37
38	39	40	41	42	43
44	45	46	47	48	49
50	51	52	53	54	55
56	57	58	59	60	61
62	63	64	65	66	67
68	69	70	71	72	73
74	75	76	77	78	79
80	81	82	83	84	85
86	87	88	89	90	91
92	93	94	95	96	97





INTERNET CHALLENGE 6

- 2 The Sun is thought to have formed about years ago.
- 3 Each second the Sun's mass decreases by about tonnes.
- 5 It takes our Solar System about years to make one revolution around the Milky Way galaxy.
- 6 Light travels through space at a speed of metres per second.
- 7 The Sun is about miles away.
- **8** X-rays can have wavelengths as short as metres.
- 10 It is thought that the Universe contains about individual galaxies.

Match each number to a statement above.

$$5 \times 10^9$$
 2.8×10^6 2×10^{30} 5 thousand million 2.8 million 2 billion, billion, billion, billion

$$6 \times 10^3$$
 2.25×10^8 3×10^8 6 thousand 2.25 hundred million 3 hundred million

$$10^{-9}$$
 10^{11} 4×10^{6} one billionth 1 hundred thousand million 4 million

$$94 \times 10^6$$

94 million





INTERNET CHALLENGE 7

Look for the words below in this wordsearch, then try and define them.

Т	Е	Q	U	A	Т	I	О	N	N	D	P	О	R	I
V	X	S	P	G	F	Е	N	Y	M	Z	S	Е	R	Y
В	P	О	W	Е	R	F	Т	L	A	С	I	D	A	R
Q	R	X	О	Y	U	О	M	K	P	P	M	S	Т	L
U	Е	S	N	Е	О	A	N	Т	P	N	P	С	I	Н
О	S	L	D	R	U	S	A	О	I	S	L	D	О	S
Т	S	A	О	D	Е	R	L	U	N	F	I	V	N	J
I	I	N	О	Е	X	Y	Е	A	G	I	F	A	A	Y
Е	О	J	Е	L	N	С	D	U	Н	С	Y	R	L	Т
N	N	D	N	О	I	Т	С	N	U	F	Е	I	Q	I
T	Е	R	M	G	Е	О	W	L	A	L	Н	A	F	Т
A	R	I	L	Т	С	U	D	О	R	P	N	В	A	N
V	A	В	R	A	С	K	Е	Т	W	Т	X	L	В	Е
L	Y	Т	S	F	A	С	Т	О	R	Ι	S	Е	L	D
С	Ι	Т	A	R	D	A	U	Q	F	V	Н	I	Y	I

Word	Definition
EQUATION	
FUNCTION	
POLYNOMIAL	
QUOTIENT	
SIMPLIFY	
EXPAND	
IDENTITY	
POWER	
BRACKET	
SURD	
EXPRESSION	
INDEX	
PRODUCT	
RATIONAL	
TERM	
RACTORISE	
MAPPING	
QUADRATIC	
ROOT	
WADIARIE	

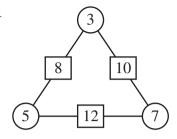




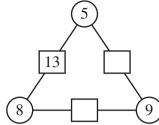


8 STARTER

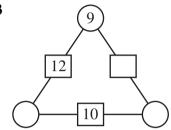
1



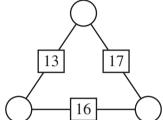
2



3



4



EXERCISE 8.8

1 $x^2 + 7x = 48$

Trial	Working	Result	Comment
x = 4 $x = 5$			
x = 5			

2 $x^2 + 5x = 9$

Trial	Working	Result	Comment
x = 1 $x = 2$			
x = 2			





EXERCISE 8.8 (continued)

3
$$x^3 + 2x = 10$$

Trial	Working	Result	Comment
x = 1 $x = 2$			
x = 2			

4
$$x^2 - 2x = 11$$

Trial	Working	Result	Comment
x = 4			
x = 5			

$$5 x^3 - 10x + 1 = 0$$

Trial	Working	Result	Comment
x = 3			
x = 4			







EXERCISE 8.8 (continued)

$$6 x^2 + 7x - 35 = 0$$

Trial	Working	Result	Comment
x = 3			
x = 4			

7
$$2x^2 + x = 7$$

Trial	Working	Result	Comment
x = 1			
x = 2			

$$x^2 + 2x = \frac{100}{x}$$

Trial	Working	Result	Comment
x = 4			
x = 5			





EXERCISE 8.8 (continued)

9
$$x(x+1) = 3$$

Trial	Working	Result	Comment
x = 1			
x = 2			

10 b) $3x^2 - x - 1 = 0$

Trial	Working	Result	Comment
x = 0			
x = 1			

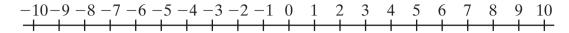
10 c) $3x^2 - x - 1 = 0$

Trial	Working	Result	Comment
x = 0			
x = -1			

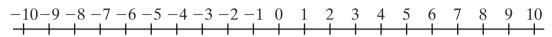


EXERCISE 8.9, Q2

a) $a \le 3$



b) b > 6



c) $c \ge -3$

_	10-	-9 –	-8 -	-7 –	6 -	5 –	4 –	3 -	-2 -	-1	0	1	2	3	4	5	6	7	8	9	1()
	1	I.									1		+									_
	т —	Т —	1	1							$\overline{}$	\neg	\neg	\neg	\neg	\neg				\neg	\neg	_

d) -4 < d < 3

$$-10-9-8-7-6-5-4-3-2-1$$
 0 1 2 3 4 5 6 7 8 9 10

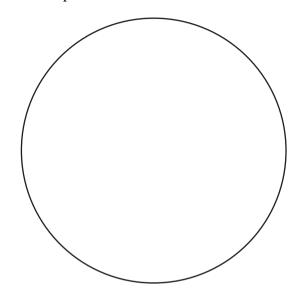
e) $-2 \le e \le 3$

_	-10-	-9	-8	-7	-6 -	-5 -	-4 -	-3 -	-2 -	-1	0	1	2	3	4	5	5	6	7	8	9	10
_	+-	+-	-	\rightarrow	-	+	-	-	-	-	-	-	\rightarrow	\rightarrow	\rightarrow		<u> </u>	-	\rightarrow	-	-	+
	•	•		•	•	•					•	•		'								

f) $-5 < f \le -1$

9 STARTER

Hint: To be sure that you can see all the regions in your drawings, try to make all the distances between points on the circle different.



Pattern 5

.... points

.... lines

.... regions

Pattern 6

.... points

.... lines

.... regions

EXERCISE 9.1

1 a)







Pattern 1

Pattern 2

Pattern 3

Pattern 4

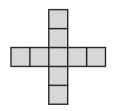
b)

Pattern number	1	2	3	4	5
Number of matches	4	7	10		

2 a)







Pattern 1

Pattern 2

Pattern 3

Pattern 4

b)

Pattern number	1	2	3	4	5
Number of squares	1	5	9		

(continued)

Speed-up sheet: Chapter 9





EXERCISE 9.1 (continued)

3 a)







Hut 1

Hut 2

Hut 3

Hut 4

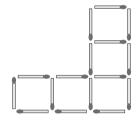
b)

Hut number	1	2	3	4	5
Number of matches	5	9	13		

a)







Pattern 1

Pattern 2

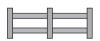
Pattern 3

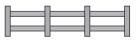
Pattern 4

b)	Pattern number	1	2	3	4	5
	Number of matchsticks	4	10	16		
	Number of squares	1	3	5		

5 a)







Fence 1

Fence 2

Fence 3

Fence 4

b)

Fence numb	oer	1	2	3	4	5	10	20
Number of	uprights	2	3	4				
Number of o	crossbars	2	4	6				





EXERCISE 9.5

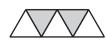
2 a)



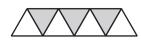
Pattern 1



Pattern 2



Pattern 3



Pattern 4

Pattern 5

b)

Pattern number	1	2	3	4	5
Number of triangles	1	3	5		

3 a)







Pattern 1

Pattern 2

Pattern 3

Pattern 4

b)	Pattern number	1	2	3	4	5
	Number of black triangles	1	3	6		
	Number of white triangles	0	1	3		
	Total number of triangles	1	4	9		





REVIEW EXERCISE 9

8 a)





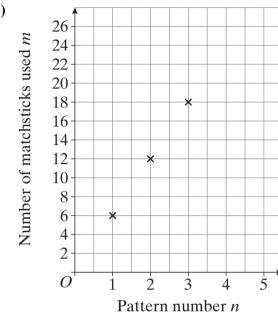
Pattern 1

Pattern 2

Pattern 3

Pattern 4

b)



[Edexcel]

11 c)



Pattern 1

Pattern 2

Pattern 3

Pattern 4

d)

Pattern number	1	2	3	4	5
Number of dots	5	8	11		

[Edexcel]





12 c)

>	<		×	×		×	×	×
×	×	×	×	×	×	×	×	×
×	×	×	×	×	×	×	×	×
>	<		×	×		×	×	×

Pattern 1

Pattern 2

Pattern 3

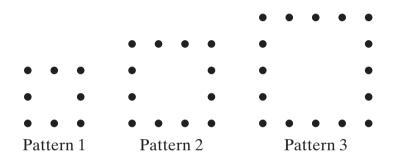
Pattern 4

 Pattern number
 1
 2
 3
 4
 5

 Number of crosses
 6
 10
 14

[Edexcel]

13 a)



Pattern 4

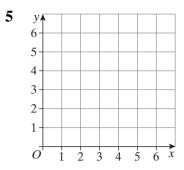
b)	Pattern number	1	2	3	4	5
	Number of dots	8	12	16		

[Edexcel]

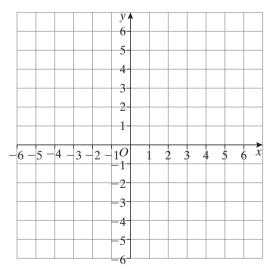


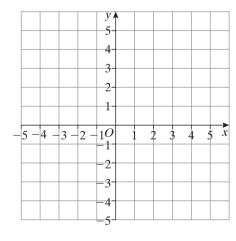
EXERCISE 10.1

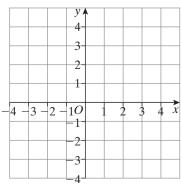
9.

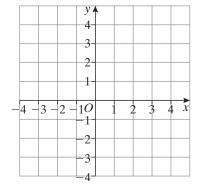


EXERCISE 10.2

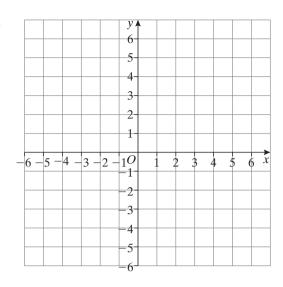






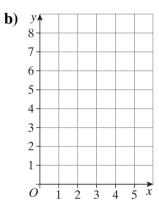






3 a) y = x + 3

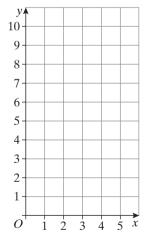
x	0	1	2	3	4	5
y	3		5		7	



4 a) y = 2x

x	0	1	2	3	4	5
y	0	2			8	

b)





EXERCISE 10.4 (continued)

5 a) y = 2x + 3

x	0	1	2	3	4	5
y	3	5				13

6 a) y = 5 - x

x	0	1	2	3	4	5
y	5	4				0

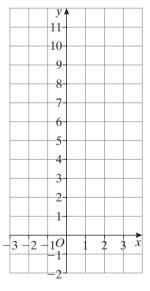
2 1 0 1 2 3 4 5 x

b)

b)

7 a) y = 2x + 5

x	-3	-2	-1	0	1	2	3
y	-1		3				11







EXERCISE 10.4 (continued)

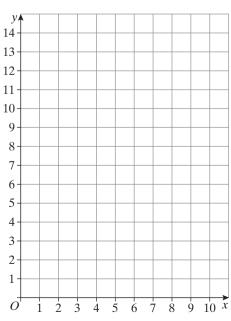
8 a) y = 5x - 7

a) $y = 5x - 7$									b)
	x	-3	-2	-1	0	1	2	3	
	у	-22			-7				

3--5 - 4 - 3 - 2 - 10-2--3--4--6 -7 -8--9-10 11 12 13 14 15 16 17 18 19 20 21

9 a) 2x + y = 14

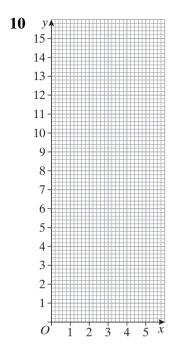
x	0	1	2	3	4	5	6
2 <i>x</i>	0			6		10	
у	14			8		4	

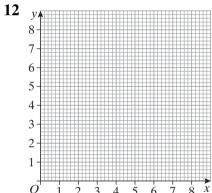


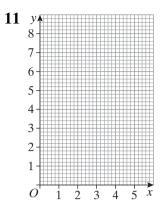
b)

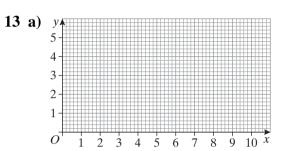


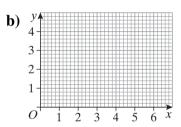
EXERCISE 10.4 (continued)

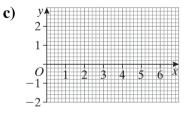












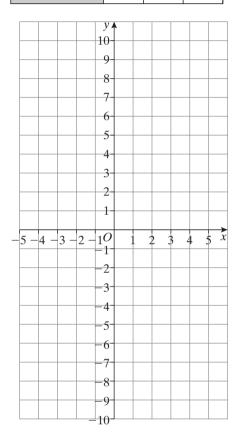


EXERCISE 10.7

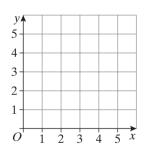
1

x	-4	0	4
y = 2x + 1			

x	-4	0	4
y = x - 2			



2



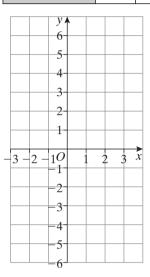
x + y = 9	0	2	5
y			

x	0	2	5
y = 2x			

3

x	-3	0	3
y = 2x			

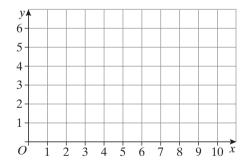
x	-3	0	3
y = x - 1			



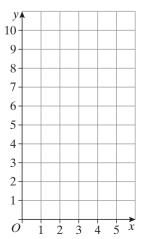
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x	0	6	10
y = x - 4			

x	0	6	10
$y = \frac{1}{2}x$			



5





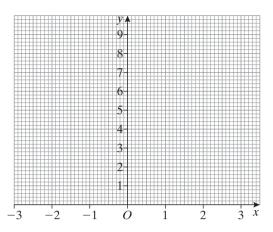


EXERCISE 10.8

1 a)

x	-3	-2	-1	0	1	2	3
x^2	9		1			4	
у	9		1			4	

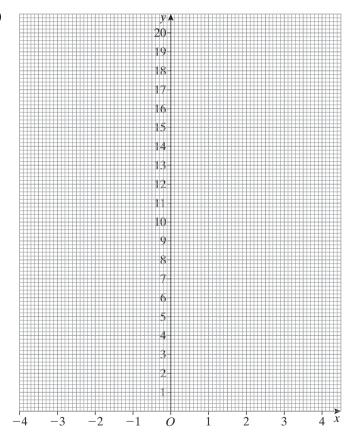
b)



a)

x	-4	-3	-2	-1	0	1	2	3	4
x^2	16			1	0	1		9	
+3	+3			+3		+3		+3	
у	19			4				12	

b)



Speed-up sheet: Chapter 10 🚊

EXERCISE 10.8 [continued]

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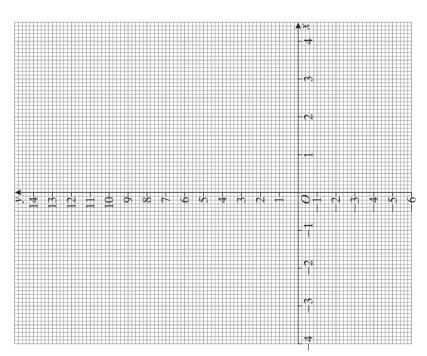
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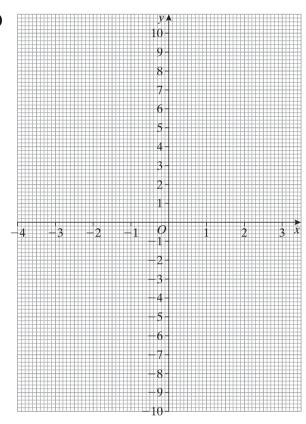


EXERCISE 10.8 (continued)

5 a)

x	-4	-3	-2	-1	0	1	2	3
x^2	16	9						9
$+2x^{2}$	-8	-6						6
-6	-6	-6						-6
y	2	-3						9

b)





EXERCISE 10.8 [continued]

x	4 -	-3	-2	-1	0	 2	3	
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5 Speed-up sheet: Chapter 10

► EXERCISE 10.8 [continued]

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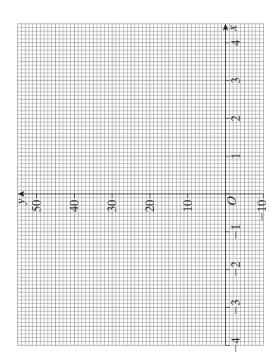


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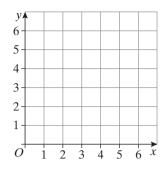
EXERCISE 10.8 [continued]



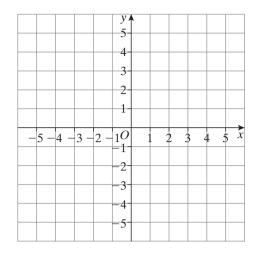


REVIEW EXERCISE 10

2



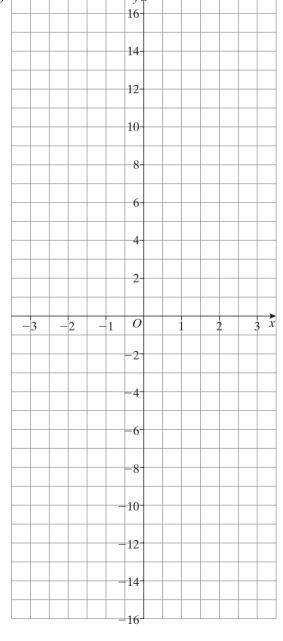
3



6 a)

x	-3	-2	-1	0	1	2	3
y				-3	2		

b)





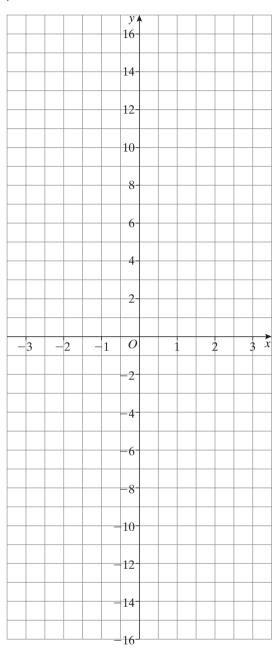


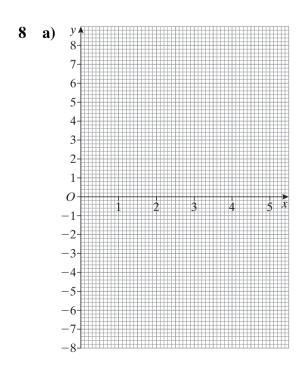


7 a)

x	-3	-2	-1	0	1	2	3
y	-13			-1			

b)









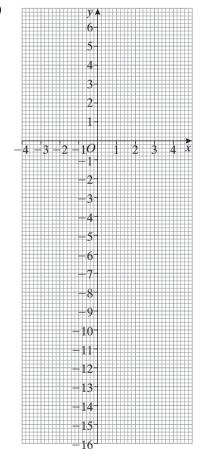
10 b)

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12 a)

x	-4	-3	-2	-1	0	1	2	3	4
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$-x^2$		-9			0		-4		
y		-6					-1		

b)



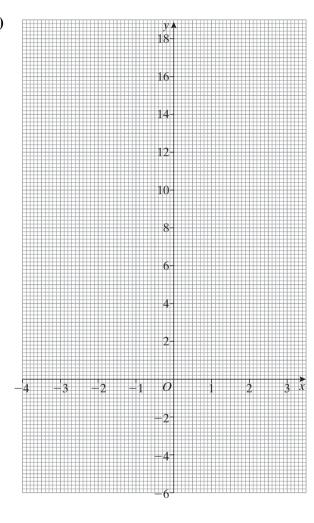




13 a)

x	-4	-3	-2	-1	0	1	2	3
x^2	16	9						9
+3x	-12	-9						+9
-2	-2	-2						-2
у	2	-2						16

b)



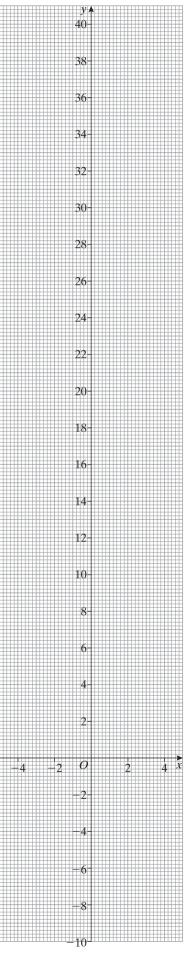




14 a)

)	x	-4	-3	-2	-1	0	1	2	3	4
	x^2		9					4		
	$3x^2$		27					12		
	-10		-10					-10		
	y		17					2		

b)





15 a)

x	-2	-1	0	1	2	3
y		1	3			

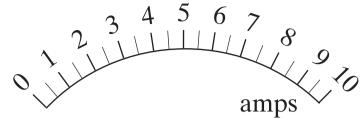
b)

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REVIEW EXERCISE 11

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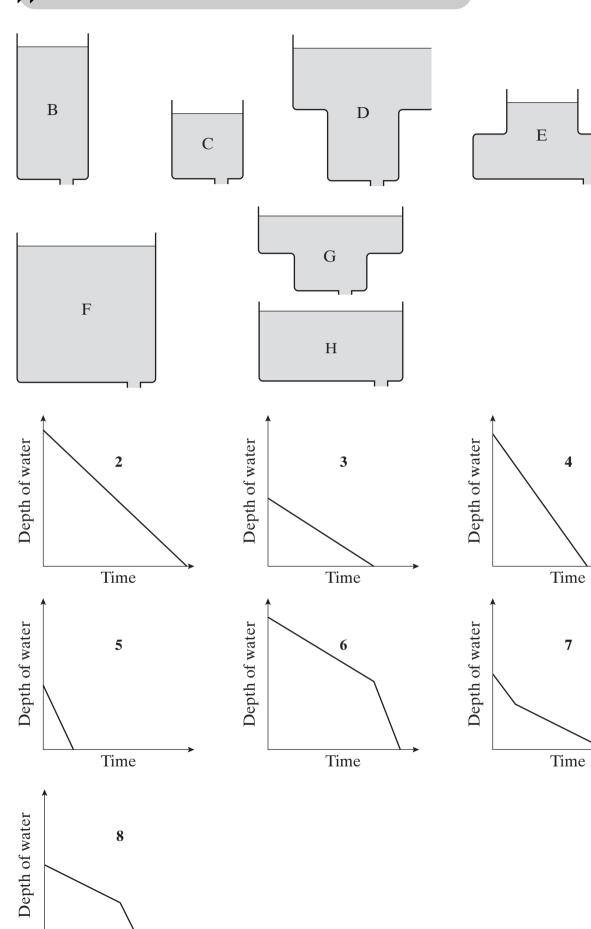
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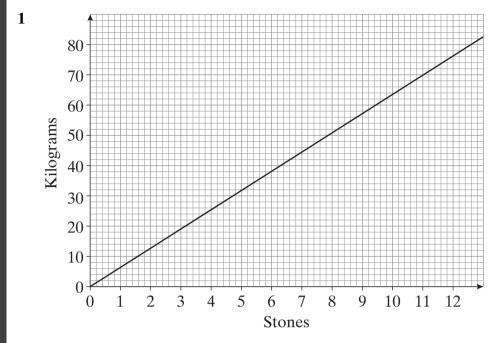
12 STARTER

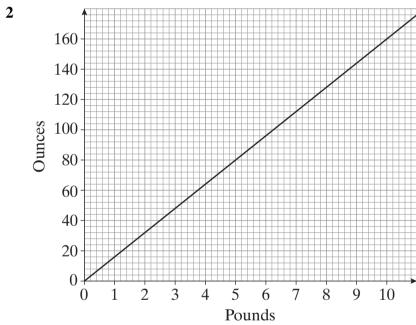


Time



EXERCISE 12.1

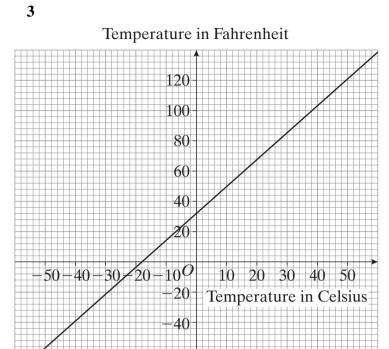


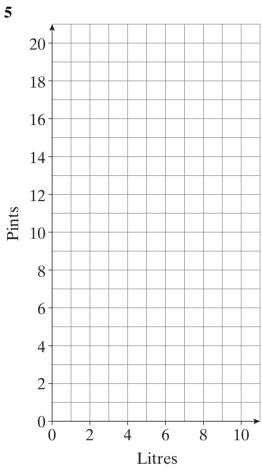


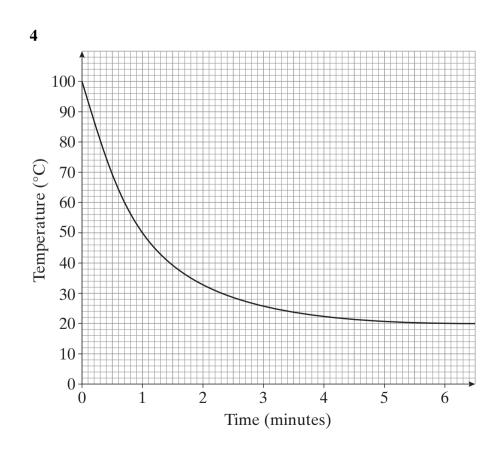




EXERCISE 12.1 (continued)



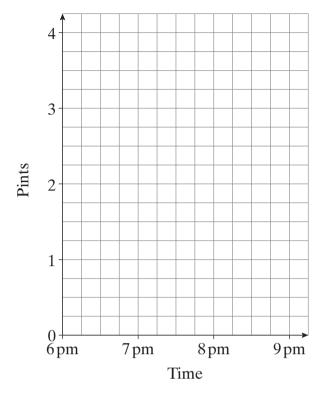




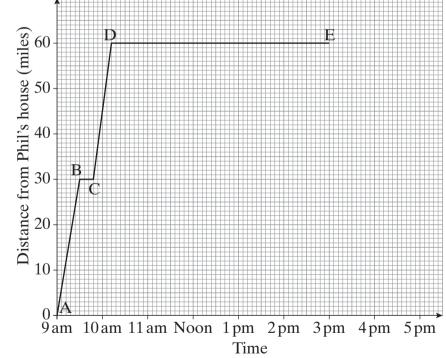


EXERCISE 12.2





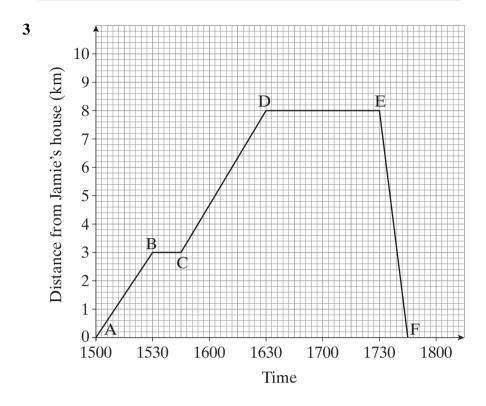
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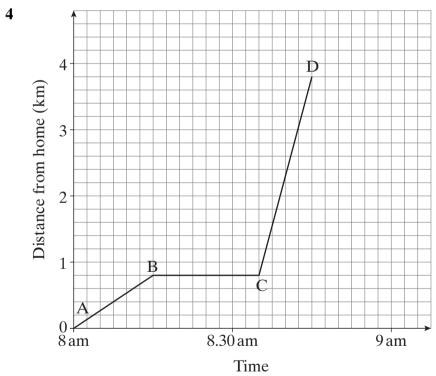






EXERCISE 12.2 (continued)



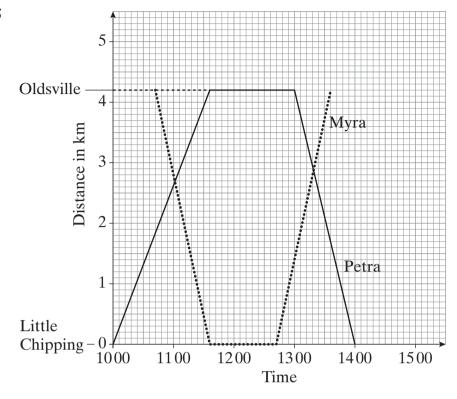




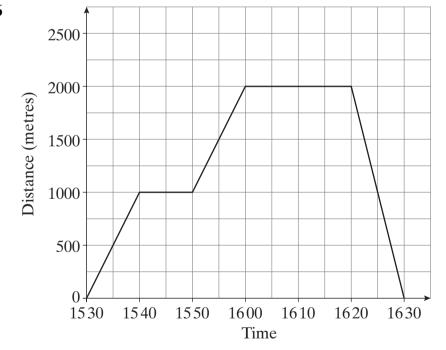


EXERCISE 12.2 (continued)





6







EXERCISE 12.2 (continued)

