

# Contents

<b>1</b>	<b>Numbers</b>	<b>3</b>
<b>2</b>	<b>Algebra and graphs</b>	<b>21</b>
<b>3</b>	<b>Coordinate geometry</b>	<b>47</b>
<b>4</b>	<b>Geometry</b>	<b>53</b>
<b>5</b>	<b>Mensuration</b>	<b>61</b>
<b>6</b>	<b>Trigonometry</b>	<b>69</b>
<b>7</b>	<b>Vectors and transformations</b>	<b>83</b>
<b>8</b>	<b>Probability</b>	<b>91</b>
<b>9</b>	<b>Statistics</b>	<b>97</b>
<b>A</b>	<b>Answers</b>	<b>105</b>



# Chapter 1

## Numbers

1. 0980\_p20\_qp\_20 Q: 10

Explain why  $\sqrt{3}$  is irrational.

..... [1]

---

2. 0980\_s20\_qp\_22 Q: 4

Write down

(a) a square number greater than 10,

..... [1]

(b) an irrational number.

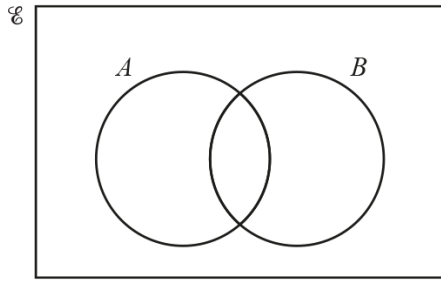
..... [1]

---

3. 0980\_p20\_qp\_20 Q: 18

Shade the region in each of the Venn diagrams below.

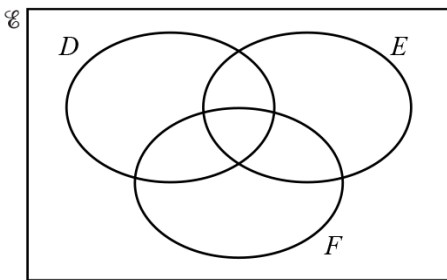
(a)



$$A' \cup B$$

[1]

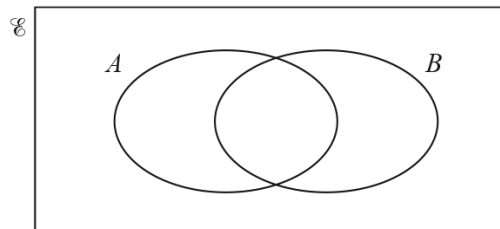
(b)



$$(D \cap E)' \cap F.$$

[1]

4. 0980\_s20\_qp\_22 Q: 7

On the Venn diagram, shade the region  $A \cap B$ .

[1]

5. 0980\_w19\_qp\_21 Q: 23

$$\mathcal{E} = \{0, 1, 2, 3, 4, 5, 6\}$$

$$A = \{0, 2, 4, 5, 6\}$$

$$B = \{1, 2, 5\}$$

Complete each of the following statements.

$$n(B) = \dots\dots\dots$$

$$A \cup B' = \{\dots\dots\dots\}$$

$$\{0, 4, 6\} = \dots\dots\dots \cap \dots\dots\dots$$

$$\{2, 4\} \dots\dots\dots A \quad [4]$$

6. 0980\_s20\_qp\_22 Q: 2

At noon the temperature in Maseru was  $21^\circ\text{C}$ .

At midnight the temperature had fallen by  $26^\circ\text{C}$ .

Work out the temperature at midnight.

$$\dots\dots\dots^\circ\text{C} \quad [1]$$

7. 0980\_p20\_qp\_20 Q: 3

Here is a list of numbers.

Put a ring around the number with the largest value.

$$0.3030 \quad \frac{1}{3} \quad 0.0330 \quad \frac{3}{10} \quad 33\% \quad [1]$$

8. 0980\_p20\_qp\_20 Q: 20

Write the recurring decimal  $0.3\dot{2}$  as a fraction.

You must show all your working.

$$\dots\dots\dots [2]$$

9. 0980\_s20\_qp\_22 Q: 8

Write  $2^{-4}$  as a decimal.

..... [1]

---

10. 0980\_s20\_qp\_22 Q: 16

Calculate  $(3 \times 10^{-3})^3$ .

Give your answer in standard form.

..... [1]

---

11. 0980\_w19\_qp\_21 Q: 4

Write 15 060

(a) in words,

..... [1]

(b) in standard form.

..... [1]

---

12. 0980\_p20\_qp\_20 Q: 14

**Without using your calculator**, work out  $1\frac{7}{12} + \frac{13}{20}$ .

You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

---

13. 0980\_s20\_qp\_22 Q: 11

**Without using a calculator**, work out  $1\frac{3}{4} - \frac{11}{12}$ .

You must show all your working and give your answer as a fraction in its simplest form.

..... [3]

14. 0980\_w19\_qp\_21 Q: 8

**Without using a calculator**, work out  $\frac{5}{16} \times 1\frac{1}{7}$ .

You must show all your working and give your answer as a fraction in its simplest form.

..... [2]

15. 0980\_p20\_qp\_20 Q: 11

The mass,  $m$  kilograms, of a horse is 429 kg, correct to the nearest kilogram.

Complete this statement about the value of  $m$ .

.....  $\leq m <$  ..... [2]

16. 0980\_s20\_qp\_22 Q: 15

Ella's height is 175 cm, correct to the nearest 5 cm.

Write down the upper bound of Ella's height.

..... cm [1]

---

17. 0980\_w19\_qp\_21 Q: 12

The sides of a square are 15.1 cm, correct to 1 decimal place.

Find the upper bound of the area of the square.

..... cm<sup>2</sup> [2]

---

18. 0980\_s20\_qp\_22 Q: 17

A train of length 105 m takes 11 seconds to pass completely through a station of length 225 m.

Calculate the speed of the train in km/h.

..... km/h [3]

---



# Appendix A

## Answers

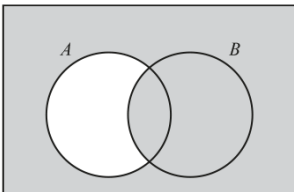
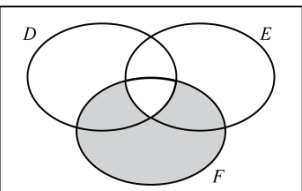
1. 0980\_p20\_MS\_20 Q: 10

	Answer	Mark	Partial Marks
	Cannot be written as a fraction oe	1	Accept 3 is a prime number Accept decimal going on forever with no pattern oe

2. 0980\_s20\_MS\_22 Q: 4

	Answer	Mark	Partial Marks
(a)	Any square number greater than 10	1	
(b)	Any irrational number	1	

3. 0980\_p20\_MS\_20 Q: 18

	Answer	Mark	Partial Marks
(a)		1	
(b)		1	

4. 0980\_s20\_MS\_22 Q: 7

	Answer	Mark	Partial Marks
	Intersection shaded	1	

5. 0980\_w19\_MS\_21 Q: 23

	Answer	Mark	Partial Marks
	3 0, 2, 3, 4, 5, 6 A....B' C	4	B1 for each

6. 0980\_s20\_MS\_22 Q: 2

	Answer	Mark	Partial Marks
	-5	1	

7. 0980\_p20\_MS\_20 Q: 3

	Answer	Mark	Partial Marks
	$\frac{1}{3}$	1	

8. 0980\_p20\_MS\_20 Q: 20

	Answer	Mark	Partial Marks
	100x = 32.22... oe	M1	
	$\frac{29}{90}$ oe fraction	B1	

9. 0980\_s20\_MS\_22 Q: 8

	Answer	Mark	Partial Marks
	0.0625	1	

10. 0980\_s20\_MS\_22 Q: 16

	Answer	Mark	Partial Marks
	$2.7 \times 10^{-8}$	1	

11. 0980\_w19\_MS\_21 Q: 4

	Answer	Mark	Partial Marks
(a)	Fifteen thousand [and] sixty	1	
(b)	$1.506[0] \times 10^4$	1	

12. 0980\_p20\_MS\_20 Q: 14

	Answer	Mark	Partial Marks
	Common denominator 60	<b>B1</b>	Accept $k \times 60$
	$\frac{35 \text{ (or } 95)}{60} + \frac{39}{60}$	<b>M1</b>	Accept $\frac{35k \text{ (or } 95k)}{60k} + \frac{39k}{60k}$
	$\frac{134}{60}$ or $1\frac{74}{60}$ or $2\frac{14}{60}$ and $2\frac{7}{30}$	<b>A1</b>	Accept $\frac{134k}{60k}$ or $1\frac{74k}{60k}$ or $2\frac{14k}{60k}$ and $2\frac{7}{30}$

13. 0980\_s20\_MS\_22 Q: 11

	Answer	Mark	Partial Marks
	$\frac{7}{4}$	$\frac{9}{12}$	<b>B1</b>
	$\frac{21}{12}$	$1 - \frac{2}{12}$	<b>M1</b>
	$\frac{5}{6}$	$\frac{5}{6}$	<b>A1</b>

14. 0980\_w19\_MS\_21 Q: 8

	Answer	Mark	Partial Marks
	$\frac{5}{16} \times \frac{8}{7}$	<b>M1</b>	
	$\frac{5}{14}$ cao	<b>A1</b>	

15. 0980\_p20\_MS\_20 Q: 11

	Answer	Mark	Partial Marks
	428.5	<b>1</b>	First value
	429.5	<b>1</b>	Second value

16. 0980\_s20\_MS\_22 Q: 15

	Answer	Mark	Partial Marks
	177.5	<b>1</b>	

17. 0980\_w19\_MS\_21 Q: 12

	Answer	Mark	Partial Marks
	229.5225 final answer cao	<b>2</b>	<b>M1</b> for $(15.1 + 0.05)^2$ or <b>B1</b> for 15.15 seen