

# Contents

Pearson Mathematics 7–10 writing and development team	iii		
Series features	viii		
Using Pearson Mathematics	x		
<b>Chapter 1 Integers and indices</b>	<b>2</b>		
Recall 1	4		
Exploration Task: Comparing powers	4		
<b>1.1 Integers review</b>	5		
Problem solving: Lab maths	12		
Investigation: Walking the plank	13		
<b>1.2 Integer multiplication</b>	14		
Puzzle: The 1 dilemma	18		
<b>1.3 Integer division</b>	19		
Game: 3 in a row	23		
Gamespace: Cryogenic crisis	24		
Half-time 1	26		
<b>1.4 Combined operations with integers</b>	27		
Puzzle: Animal speed challenge	31		
Maths 4 Real: The ultimate cool	32		
<b>1.5 Multiplying and dividing numbers in index form</b>	34		
Game: Closest to 500	43		
Investigation: Cyclic powers	44		
<b>1.6 Powers of powers, products and quotients</b>	45		
Challenge 1	50		
Chapter review 1	51		
Numeracy practice 1	55		
<b>Chapter 2 Fractions, decimals and percentages</b>	<b>56</b>		
Recall 2	58		
Exploration Task: Is this right?	58		
<b>2.1 Working with fractions and decimals</b>	59		
Puzzle: Sudoku	66		
<b>2.2 Types of decimals</b>	67		
Puzzle: Hitori	74		
Investigation: Terminating and recurring decimals	75		
<b>2.3 Negative fractions and decimals</b>	76		
<b>2.4 Estimating percentages</b>	84		
Game: Best estimate	88		
<b>2.5 Writing fractions and decimals as percentages</b>	89		
Puzzle: KenKen	97		
Half-time 2	98		
<b>2.6 Writing percentages as fractions and decimals</b>	99		
Game: First to change	105		
<b>2.7 Writing one amount as a percentage of another</b>	106		
Problem solving: League tables	112		
<b>2.8 Finding a percentage of an amount</b>	113		
Problem solving: Cordial contents	117		
Gamespace: Alice in Numberland	118		
<b>2.9 Increasing or decreasing by a given percentage</b>	120		
Puzzle: Break the code	123		
Investigation: Supermarket specials	124		
<b>2.10 Financial applications of percentages</b>	126		
Problem solving: The plummeting price	135		
Exploration Spreadsheet: Sam's Skate Shop	136		
Maths 4 Real: Relative wealth	138		
Challenge 2	140		
Chapter review 2	141		
Numeracy practice 2	145		
Mixed review A	146		
<b>Chapter 3 Algebra</b>	<b>148</b>		
Recall 3	150		
Exploration Task: Which is larger?	150		
<b>3.1 Variables and expressions</b>	151		
Problem solving: Tricky algebra	157		
<b>3.2 Substitution for variables</b>	158		
Game: 4 in a row	162		
<b>3.3 Using formulas</b>	163		
Puzzle: How old am I?	167		
Investigation: Take your medicine	168		
Maths 4 Real: Astronomical algebra	170		

3.4 Simplifying expressions	172	<b>Chapter 5 Measurement</b>	<b>268</b>
Half-time 3	177	Recall 5	270
Gamespace: Magic algebra	178	Exploration Task: Can squares and rectangles be equal?	270
3.5 Multiplying and dividing algebraic terms	180	5.1 Perimeter	271
Problem solving: Make a profit	183	Game: That formula is mine	277
3.6 Expanding brackets	184	5.2 Circle relationships	278
Puzzle: The rat race	189	Exploration CAS: The relationship between the circumference and diameter of a circle	281
Exploration Spreadsheet: Farmer Jones' dilemma	190	5.3 Circumference	283
3.7 Factorising	192	Problem solving: The icing on the cake	288
Challenge 3	197	Investigation: Staggered starts	289
Chapter review 3	198	5.4 Area	291
Numeracy practice 3	201	Problem solving: Tiling a floor	302
Exploration STEM: Planes, trains, boats and automobiles	202	Half-time 5	303
Exploration STEM: The scale of the universe	202	5.5 Area of a circle	304
Exploration STEM: Fishing, angling, netting	203	Problem solving: Victa the goat	310
Exploration Coding: Quick division	203	Exploration CAS: Area of equilateral triangles	311
<b>Chapter 4 Ratio and rate</b>	<b>204</b>	5.6 Finding the area of composite shapes	314
Recall 4	206	Problem solving: Doubling a square	321
Exploration Task: Ratios	206	Gamespace: Are we there yet?	322
4.1 Writing ratios	207	5.7 Volume and capacity	324
Game: The game of Nim	212	Problem solving: Baffling box	333
4.2 Simplifying ratios	213	5.8 Time	334
Gamespace: Human ratios	218	Puzzle: Time gone cuckoo	344
4.3 Unit ratios and scale factors	220	Challenge 5	345
Problem solving: Cartoon capers	228	Maths 4 Real: Today's date is ...	346
4.4 Using ratios to find amounts	229	Chapter review 5	348
Puzzle: Sudoku	235	Numeracy practice 5	351
Investigation: Bicycle gears	236		
Maths 4 Real: The golden ratio – fact or fiction?	238		
Half-time 4	240		
4.5 Scale drawings	241		
4.6 Sharing an amount in a given ratio	248		
Problem solving: Catch 22	251		
4.7 Rates	252		
Problem solving: Numbeerrrrrrrrs	260		
Challenge 4	261		
Chapter review 4	262		
Numeracy practice 4	265		
Mixed review B	266		

<b>Chapter 6 Linear graphs</b>	<b>352</b>		
Recall 6	354		
Exploration Task: Slopes	354		
<b>6.1</b> Interpreting line graphs	355		
Problem solving: Where is the missing area?	361		
<b>6.2</b> Linear relationships	362		
Puzzle: Who's who?	374		
Half-time 6	375		
Gamespace: Algebra EV racers	376		
Exploration CAS: Exploring gradients and intercepts with technology	378		
<b>6.3</b> Finding the rule	380		
Puzzle: The Liar-bird and the Tru-tru-bird	387		
Exploration CAS: Be still my beating heart	388		
<b>6.4</b> Using linear relationships	390		
Puzzle: What number am I?	399		
Investigation: Captivating conversions	400		
Maths 4 Real: Algebra on the move	404		
Challenge 6	406		
Chapter review 6	407		
Numeracy practice 6	409		
Mixed review C	411		
Exploration STEM: Shapes, sizes, areas and volumes	413		
Exploration STEM: Geometric patchwork ploughing	413		
Exploration Coding: Encrypt and decrypt messages	413		
<b>Chapter 7 Linear equations</b>	<b>414</b>		
Recall 7	416		
Exploration Task: Who is right?	416		
<b>7.1</b> The language of equations	417		
Puzzle: Lots of letters	420		
<b>7.2</b> Solving linear equations	421		
Puzzle: Algebra fruit bowl	431		
<b>7.3</b> Solving more complex equations	432		
Puzzle: Alphametics	439		
Investigation: Magic calendar squares	440		
Half-time 7	442		
<b>7.4</b> Solving equations with the unknown on both sides	443		
Problem solving: Magic algebra squares	450		
Exploration Spreadsheet: How tricky was that!	451		
<b>7.5</b> Solving problems using equations	453		
Problem solving: The perfect holiday	457		
Gamespace: Into the matrix	458		
Maths 4 Real: Virgin Galactic	460		
Challenge 7	462		
Chapter review 7	463		
Numeracy practice 7	465		
<b>Chapter 8 Geometry</b>	<b>466</b>		
Recall 8	468		
Exploration Task: Squares, quadrilaterals, rectangles, parallelograms	468		
<b>8.1</b> Angles review	469		
Puzzle: Angle art	476		
Exploration CAS: Properties of quadrilaterals	477		
<b>8.2</b> Shapes review	484		
Puzzle: Matchstick quadrilaterals	493		
<b>8.3</b> Congruence and transformation	494		
Puzzle: The ancient tomb	502		
Half-time 8	503		
Maths 4 Real: The art of M. C. Escher	504		
<b>8.4</b> Congruent triangles	506		
Problem solving: The magical pentagram	513		
Maths 4 Real: How many triangles are in a square?	514		
Investigation: The Möbius strip	516		
<b>8.5</b> Congruence and quadrilaterals	518		
Problem solving: The tablet of Geo Met Tree	524		
Challenge 8	525		
Chapter review 8	526		
Numeracy practice 8	529		

<b>Chapter 9 Statistics and probability</b>	<b>530</b>
Recall 9	532
Exploration Task: Mean versus median	532
<b>9.1</b> Population sampling	533
Problem solving: How many trains?	545
<b>9.2</b> Using sample measures of centre and spread	546
<b>9.3</b> Frequency tables and graphs	554
Problem solving: Missing frequencies	560
Exploration Spreadsheet: Can technology improve sporting achievement?	561
<b>9.4</b> Statistics from grouped data	563
Puzzle: Complete the patterns	573
Maths 4 Real: Which statistic is best in sport?	574
Half-time 9	576
Investigation: Who's the best? Here's the test	578
Maths 4 Real: Hold the front page	580
<b>9.5</b> Understanding probability	582
Puzzle: Track the bracket	587
<b>9.6</b> Theoretical probability	588
Problem solving: Random walks	592
<b>9.7</b> Venn diagrams and sample space	593
Problem solving: Inventive Venn	605
Challenge 9	606
Chapter review 9	607
Numeracy practice 9	611
Mixed review D	613
Answers	616
Glossary and index	684