

Answers: SATs Made Simple: Algebra workbook

1 EQUIVALENCE

Page 7: Practice

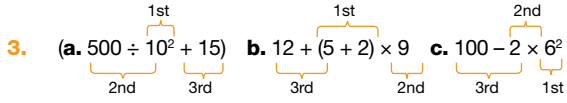
- a. 91 b. 480 c. 66
- a. 120 b. 100 c. 52
(d. 52) e. 150 f. 40
- (a. $980 = 14 \times 70$) b. $31 - 12 = 19$ c. $200 \div 2 = 20 \times 5$
d. $750 - 250 = x$ e. $x - 8 = y + 11$

Page 8: Solve problems

- a. $10 \times 32 = 8 \times 40$ b. $320 + 320 = 640$ sheep
- $x \times 4 - 11 = 17$ or $4x - 11 = 17$
- $21 + 25 = 22 + 24$
(Other answers are acceptable if both sides equal 46.)
- Meg is correct. She has written an equivalent equation by swapping the positions of the expressions. Luca has changed the expressions. For example, he has written $y - 10$ instead of $y + 15$, which is not equivalent.

2 ORDER OF OPERATIONS

Page 10: Practice

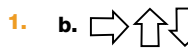
- (a. $75 - 5 \times 5$) b. $8 \times (21 - 14)$ c. $54 \div 3^2$
d. $(40 \times 2) + 120$ e. $3 \times 12 \div 4$
- a. 50 b. 56 c. 6 d. 200 e. 9
- (a. $500 \div 10^2 + 15$) b. $12 + (5 + 2) \times 9$ c. $100 - 2 \times 6^2$

- a. 20 b. 75 c. 28
- a. F b. F c. T d. T e. T
- a. 42 b. 9 c. 125 d. 50 e. 90

Page 11: Solve problems

- a. $10 \div 2 = 3$ b. $3 \times (4 + 2) = 18$
c. $15 - 3 \times 2 = 9$
- £5.50
- a. $y = x - 8$ b. (5, -3)

3 PATTERNS

Page 13: Practice

- b. 
- ∇
- a. 35, 42.5, 50 b. 57.5
- a. 10 b. 31 c. Row $y = \text{Row } x \times 3 + 1$

Page 14: Solve problems

- Yes, Dylan is correct. Although the rule for the sequence is to add 4 each time, the numbers in the sequence will always be one more than the multiples of 4. Each number in the sequence is odd and all multiples of 4 are even.
- a. 9 matchsticks b. 16 triangles
- medium

4 LINEAR NUMBER SEQUENCES

Page 16: Practice

- a. 8, 20, 32, 44, 56, 68
b. 19.5, 17.4, 15.3, 13.2, 11.1, 9.0
c. -10, -4, 2, 8, 14, 20
d. 1363, 1263, 1163, 1063, 963, 863
- a. 0.3, 0.7, 1.1, 1.5, 1.9, 2.3 The rule is 'Add 0.4'.
b. 98, 87, 76, 65, 54, 43 The rule is 'Subtract 11'.
c. 66, 78, 90, 102, 114, 126 The rule is 'Add 12'.
d. 12.5, 10, 7.5, 5, 2.5, 0 The rule is 'Subtract 2.5'.

Page 17: Solve problems

- 24, 56, 88, 120, 152
- a.

4	6	8	10
11	13	15	17
18	20	22	24
25	27	29	31

b. Add 2 c. Add 7 d. Add 9
- 3.8, 3.2, 2.6, 2, 1.4, 0.8, 0.2, -0.4, so 0.2 is closest to zero.
- Ethan is correct because the numbers in the sequence are decreasing, meaning 9 is being subtracted each time. Lena is incorrect. For example, if you add 9 to -3, the answer is 6.

5 NON-LINEAR NUMBER SEQUENCES

Page 19: Practice

- a. 2.5, 5, 10, 20, 40, 80
b. 140, 14, 1.4, 0.14, 0.014, 0.0014
c. 3, 4, 7, 16, 43, 124
d. 24, 26, 30, 38, 54, 86
- a. 0.58, 5.8, 58, 580, 5800, 58,000 The rule is 'Multiply by 10'.
b. 37, 21, 13, 9, 7, 6 The rule is 'Add 5 and divide by 2'.
- a. 2, 3, 5, 8, 12, 17
b. 10, 6, 0, -8, -18, -30
- The rule is: 'The first difference is +10. The difference increases by 3 each time.'

Page 20: Solve problems





- 6, 90, 930, 9330, 93,330
- 26, 30, 36, 44, 54
- 2, 6, 14, 30, 62, 126 ... 14 and 126 make a total of 140.
- $1 + 2 = 3$, $3 + 4 = 7$, $7 + 8 = 15$, $15 + 16 = 31$

6 MISSING NUMBERS

Page 22: Practice

- a.** 13 **b.** 36 **c.** 40 **d.** 8 **e.** 150 **f.** 100
- a.** 80 **b.** 21 **c.** 6 **d.** 121 **e.** 3 **f.** 60
- a.** 30 **b.** 91 **c.** 20 **d.** 250

Page 23: Solve problems

- | | | | | |
|----|---|----|---|----|
| 7 | = | 10 | - | 3 |
| x | | = | | x |
| 3 | | 4 | | 5 |
| = | | + | | = |
| 21 | - | 6 | = | 15 |
- True. Explanations will vary, but could show that $2.5 \times 11 = 27.5$: e.g. '10 \times 2.5 = 25 and 1 \times 2.5 = 2.5. If you add 25 and 2.5 then you get 27.5'.
-  = 33,  = 52,  = 4.2,  = 11
- No, Jasmina is incorrect. She should have subtracted 42 from 58 instead of adding. The symbol represents 16.

7 EQUATIONS

Page 25: Practice

- a.** 18 **b.** 67 **c.** 6 **d.** 84 **e.** 1232 **f.** 22,720 **g.** 10 **h.** 1800
- a.** 5.2 **b.** 5 **c.** 0.1 **d.** 28
- a.** 38 **b.** 165 **c.** 51 **d.** 1000

Page 26: Solve problems

- $3y \rightarrow$ multiply y by 3; $y - 3 \rightarrow$ subtract 3 from y ;
 $y + 3 \rightarrow$ add 3 to y ; $\frac{y}{3} \rightarrow$ divide y by 3
- a.** $f - 12 = 29$ **b.** 41
- a.** $x + 30 + 80 = 180$ **b.** 70°
- $y + 372 + 317 + 255 = 1080$, so $y = 1080 - 944 = 136m$

8 MORE EQUATIONS

Page 28: Practice

- a.** Add 11 to both sides. Divide both sides by 4.)
b. Subtract 24 from both sides. Divide both sides by 5.
c. Subtract 18 from both sides. Multiply both sides by 9.
d. Add 5 to both sides. Multiply both sides by 12.
- a.** 9 **b.** 14 **c.** 45 **d.** 132
- a.** $5x + 15 = 100$ **b.** $3y + 13 = 19$ **c.** $5t + 5 = 59$
d. $3r - 12 = 21$
- a.** $q = 8$ **b.** $b = 7$ **c.** $k = 9$ **d.** $h = 30$

Page 29: Solve problems

- $\frac{x}{4} + 84 = 100$, so $\frac{x}{4} = 16$, so $x = 64$
- $6z + 150 = 450$, so $6z = 300$, so $z = 50$ pence
- a.** $y + y + 23 + 23 = 60$, or $2y + 46 = 60$ (or $y + 23 = 30$)
b. $y = 7$
- $4p + 260 = 500$, so $4p = 240$, so $p = 60$ g

9. EQUATIONS (TWO UNKNOWNNS)

Page 31: Practice

- $x - 17 = 15$, so $x = 15 + 17$, so $x = 32$
- $q + 210 = 450$, so $q = 450 - 210$, so $q = 240$

- a.** $(4 \times 7) + j = 40$, so $28 + j = 40$, so $j = 40 - 28$, so $j = 12$
b. $4m + 8 = 40$, so $4m = 40 - 8$, so $4m = 32$, so $m = 32 \div 4$, so $m = 8$
- a.** $\frac{h}{3} - 9 = b$, so $(24 \div 3) - 9 = b$, so $8 - 9 = b$, so $b = -1$
b. $\frac{h}{3} - 9 = 8$, so $\frac{h}{3} = 8 + 9$, so $\frac{h}{3} = 17$, so $h = 17 \times 3$, so $h = 51$

Page 32: Solve problems

- a.** $(11 \times 4) + 2.5 = c$, so $44 + 2.5 = c$, so $c = \text{£}46.50$
b. $11p + 2.5 = 90.5$, so $11p = 90.5 - 2.5$, so $11p = 88$, so $p = 88 \div 11$, so $p = 8$ people
- $v = 5k - 25$, so $v = (5 \times 12) - 25$, so $v = 60 - 25$, so $v = 35$
- $2x - 5 = (3 \times 9) + 8$, so $2x - 5 = 35$, so $2x = 35 + 5$, so $2x = 40$, so $x = 20$
- a.** $24.5 = 2w + (2 \times 5.25)$, so $24.5 = 2w + 10.5$, so $24.5 - 10.5 = 2w$, so $14 = 2w$, so $w = 7$ cm
b. $a = 7 \times 5.25$, so $a = 36.75\text{cm}^2$

10 POSSIBLE NUMBERS

Page 34: Practice

- a.** 9 and 6 or 7 and 8
b. 7 and 8 or 9 and 6
- $e = 41$ and $f = 12$
- Answers may vary. Examples:
a. $p = 14$ and $g = 5$
b. $d = 8$ and $f = 3$
c. $m = 12$ and $q = 2$
d. $j = 7$ and $b = 4$
- a.** $y = 8$ and $x = 2$ (or $y = 4$ and $x = 1$)
b. $y = 4$ and $x = 1$ (or $y = 8$ and $x = 2$)

Page 35: Solve problems

- a.** $p = 24$ and $r = 4$ or $p = 25$ and $r = 3$ or $p = 26$ and $r = 2$ or $p = 27$ and $r = 1$
b. as above
- $x = 4$ and $y = 8$ or $x = 8$ and $y = 4$
- a.** $v = 2$ and $w = 6$
b. $v = 5$ and $w = 5$
c. $v = 8$ and $w = 4$
(The answers can be in any order.)
- $a = 1$ and $b = 17$ or $a = 2$ and $b = 13$ or $a = 3$ and $b = 9$

11 WORD FORMULAE

Page 37: Practice

- c.** Number of loaves + numbers of sticks + number of rolls = total products
- a.** Pounds = kilograms \times 2.2
- Price = $\text{£}10 \times$ number of items + $\text{£}2.50$
- The width = area of the rectangle \div its height

Page 38: Solve problems

- $(40 \times 2.5) + 20 = 120$ minutes or 2 hours
- $70 \div 5 = 14$, $14 \times 8 = 112$ km
- $25 \times 687 = 17,175$ hours
- $340 \div 4 = 85$, $85 \times 3 = 255$ ml

12 ALGEBRAIC FORMULAE

Page 40: Practice

- c.** $a = wh$
- d.** $c = s + o + w$
- a.** $a = \frac{wh}{2}$
- $t = 10 + b - s$
- $g = v + 3v$ or $g = 4v$

Page 41: Solve problems

- $x + 34^\circ + 76^\circ = 180^\circ$, so $x = 180^\circ - 34^\circ - 76^\circ$, so $x = 70^\circ$
- $114 = 6s$, so $114 \div 6 = s$, so $s = 19$
- $b = (j + 4) \div 2$, so $12 + 4 = 16$ and $16 \div 2 = 8$, so $b = 8$
- $(2 \times 29^\circ) + 2b = 360^\circ$, so $58^\circ + 2b = 360^\circ$,
so $2b = 360^\circ - 58^\circ$, so $2b = 302^\circ$, so $b = 151^\circ$

PRACTICE TEST 1 – ARITHMETIC (PAGES 42–43)

- 4
- 147
- 1306
- 370
- 76
- 70
- 111
- 3080
- 72
- 5
- 60
- 32
- 685
- 4
- 84
- 12
- 340
- 1800
- 19
- 64

PRACTICE TEST 2 – REASONING (PAGES 44–47)

- circle and star
- 9, 7, 3, -5
- $n + 0.5n$
- £3.35
- 36
- 25
- $7p - 3$
- $y = 5$; $y^2 - y = 20$
- When $p = 4$ and $q = 4$ and when $p = 6$ and $q = 3$
- 3 or 4
- 51cm
- 136