Revision & Prac Worksheet 7

A Number skills: Scientific notation — Skill 1.6

Express the following using scientific notation:

1	0.003 3	2	0.000 048	3	0.014	4	0.028 6
5	0.000 000 2	6	0.000 004 2	7	0.000 000 6	8	0.000 008 9
9	0.000 481	10	0.014 8	11	0.000 186	12	0.000 009
13	0.000 000 2	14	0.000 482	15	0.000 000 008 9		

Write the numbers for these expressions:

16	8.043×10^{-6}	17	6.093×10^{-4}	18	8.104×10^{-3}	19	1.076×10^{-11}
20	8.21×10^{-4}	21	3.09×10^{-5}	22	3.023×10^{6}	23	5.012×10^{3}
24	6.09×10^{5}	25	1.568×10^{9}	26	2.314×10^{10}	27	3.814×10^{7}

B Number applications: Sharing quantities in a given ratio — Skill 2.1

1 Steve and Colin decide to share a potential lottery win in the ratio of their contributions to buy the ticket. If Steve puts in \$3.50 for a \$10.00 ticket then how much will each receive if they win \$1.1 million?

2 A block of chocolate with 48 squares is to be shared in the ratio of 1:2:4. To the nearest square, how much will each receive?

C Algebra: Working with lateral equations — Skill 3.8

1 Make b the subject of these equations:

(a) $A = Lb$ (b) $V = Lbh$ (c) $W = 4ab^2$ (d) $A = \frac{1}{2}bh$

(e) $Z = \frac{bh^2}{6}$ (f) $A = \frac{1}{2}(a+b)h$ (g) $W = aL + b$ (h) $F = \frac{b}{r^2} + a$

(i) $P = a + \frac{w}{b}$ (j) $S = \frac{b}{2}(a+c)$ (k) $P = b(a-d) + s$ (l) $A = \pi b^2$

2 The formula connecting a particle's velocity (v m/s), acceleration (a m/s^2) and distance travelled (s m) is $v^2 = 2a$. Make s the subject and so find the distance travelled for these values:

(a) $v = 9$ m/s, $a = 2$ m/s^2 (b) $v = 4$ m/s, $a = 3$ m/s^2
(c) $v = 10$ m/s, $a = 3$ m/s^2 (d) $v = 1.8$ m/s, $a = 0.3$ m/s^2
(e) $v = 3.9$ m/s, $a = 2.6$ m/s^2 (f) $v = 11.2$ m/s, $a = 6.3$ m/s^2

D Algebra: Simultaneous equations — Skill 3.9

1 Solve these simultaneous equations using the substitution method:

(a) $y = 3x$, $x + 2y = 14$ (b) $y = -x$, $x + 2y = -4$
(c) $y = x + 2$, $2x + y = 11$ (d) $x = 6 + y$, $4x + 3y = 31$

2 Solve these simultaneous equations using the elimination method:

(a) $x + y = 16$, $x - y = -2$ (b) $3x + y = 4$, $-2x - y = 6$ (c) $2x + 3y = 12$, $x + y = 3$ (d) $5x - 2y = 10$, $x + y = 2$

E Indices: Expanding brackets with indices — Skill 4.5

Simplify:

1 $\left(\frac{2a^4}{b}\right)^3$ 2 $\left(\frac{3^2a}{b^4}\right)^2$ 3 $\left(-6^2a^4b^5\right)^2$ 4 $-\left(\frac{2a^2b^4}{c}\right)^3$

5 $\left(\frac{5^2ab^3}{c^4}\right)^2$ 6 $\left(\frac{-3^3a^2}{b^4}\right)^2$ 7 $\left(\frac{a^2b^3}{c^4}\right)^{10}$ 8 $\left(\frac{2^3a}{b^2}\right)^3$

9 $\left(\frac{-3^2b^4}{c^4}\right)^3$ 10 $\left(6^2a^4b^3\right)^2$ 11 $\left(-4a^2b^3c^4\right)^3$ 12 $\left(-3a^4b^6c^8\right)^2$

Worksheet 7

A **1** 3.8×10^{-3} **2** 4.8×10^{-5} **3** 1.4×10^{-2}
4 2.86×10^{-2} **5** 2×10^{-7} **6** 4.2×10^{-6}
7 6×10^{-7} **8** 8.9×10^{-6} **9** 4.81×10^{-4}
10 1.48×10^{-2} **11** 1.86×10^{-4} **12** 9×10^{-6}
13 2×10^{-7} **14** 4.82×10^{-4} **15** 8.9×10^{-9}
16 0.000 008 043 **17** 0.000 609 3
18 0.008 104 **19** 0.000 000 000 010 76
20 0.000 821 **21** 0.000 030 9
22 3 023 000 **23** 5012
24 609 000 **25** 1 568 000 000
26 23 140 000 000 **27** 38 140 000

B **1** Steve \$385 000, Colin \$715 000
2 7, 14, 27

C **1** (a) $b = \frac{A}{L}$ (b) $b = \frac{V}{Lh}$ (c) $b = \sqrt{\frac{W}{4a}}$
(d) $b = \frac{2A}{h}$ (e) $b = \frac{6Z}{h^2}$ (f) $b = \frac{2A}{h} - a$
(g) $b = W - aL$ (h) $b = r^2(F - a)$ (i) $b = \frac{w}{(P-a)}$
(j) $b = \frac{2S}{(a+c)}$ (k) $b = \frac{P-s}{a-d}$ (l) $b = \sqrt{\frac{A}{\pi}}$

2 $s = \frac{v^2}{2a}$
(a) 20.25 m (b) $2\frac{2}{3}$ m (c) $16\frac{2}{3}$ m
(d) 5.4 m (e) 2.925 m (f) 9.96 m

D **1** (a) $x = 2, y = 6$ (b) $x = 4, y = -4$
(c) $x = 3, y = 5$ (d) $x = 7, y = 1$
2 (a) $x = 7, y = 9$ (b) $x = 10, y = -26$
(c) $x = -3, y = 6$ (d) $x = 2, y = 0$

E **1** $\frac{8a^{12}}{b^3}$ **2** $\frac{81a^2}{b^8}$ **3** $1296a^8b^{10}$
4 $\frac{-8a^6b^{12}}{c^3}$ **5** $\frac{625a^2b^6}{c^8}$ **6** $\frac{729a^4}{b^8}$
7 $\frac{a^{20}b^{30}}{c^{40}}$ **8** $\frac{512a^3}{b^6}$ **9** $\frac{-729b^{12}}{c^{12}}$
10 $1296a^8b^6$ **11** $-64a^6b^9c^{12}$ **12** $9a^8b^{12}c^{16}$