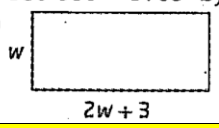
Holiday Math Practice – SOLUTIONS

<table>
<tr><th>Sheet Letter</th><th>Sheet Title</th><th>Day</th></tr>
<tr><td>A</td><td>3.5 Collect Like Terms Part 1
4. a) $8x + 6$ b) $2y + 2$ c) $3m + 1$ d) $n - 6$ e) $5x^2 + 9$
f) $3a - 2b$
5. a) $7x^2 + 7x$ b) $2a - 2$ c) $2m^2 - 2m - 1$
d) $4w^3 + 6w^2 - w$
6. a) $a^2 - 3ab - b^2$ b) $m^3n^2 + m^2n^3$ c) $-7x^2y - 3x + 2$
d) $7r^4 + r^2 - 3$
7. a) $2(w + 5w)$ or $2(6w)$ or $12w$, where w is the width of the garden
b) 240 m c) width: 15 m; length: 75 m d) $5w^2$
e) 4500 m^2 f) width: 10 m; length: 50 m</td><td>1</td></tr>
<tr><td>B</td><td>Collect Like Terms Part 2
9. a) $4x$ b) x^2 c) 20 m
12. a) John multiplied the like terms instead of adding them.
b) Answers will vary. Example: Substitute any value for x into the original expression and into the simplified expression.
c) $2x^2 + 5x$. Verify by substituting a value for x into the expressions.</td><td>1</td></tr>
<tr><td>C</td><td>Writing Algebraic Expressions
7. a) Variable chosen may vary; c b) $0.45c$
c) $9 d) $6300
8. a) $2b + f$, where b represents the number of baskets and f represents the number of free throws.
b) 17
9. a) $c - 2i$, where c represents the number of correct answers and i represents the number of incorrect answers.
b) 16
10. a) $10g + 5s$
b)
<table><tr><th>Term</th><th>Variable</th><th>Coefficient</th><th>Meaning</th></tr><tr><td>$10g$</td><td>g</td><td>10</td><td>g: number of gold memberships she sells
10: bonus she gets per membership</td></tr><tr><td>$5s$</td><td>s</td><td>5</td><td>s: number of silver memberships she sells
5: bonus she gets per membership</td></tr></table>c) $350
11. a) $80o + 50d + 25b$
b)
<table><tr><th>Term</th><th>Variable</th><th>Coefficient</th><th>Meaning</th></tr><tr><td>$80o$</td><td>o</td><td>80</td><td>o: the number of orchestra seats sold
80: the earnings per orchestra seat</td></tr><tr><td>$50d$</td><td>d</td><td>50</td><td>d: the number of dress circle seats sold
50: the earnings per dress circle seat</td></tr><tr><td>$25b$</td><td>b</td><td>25</td><td>b: the number of balcony seats sold
25: the earnings per balcony seat</td></tr></table>c) $21 750 d) $23 900</td><td>1</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

D	**3.6 Add and Subtract Polynomials** **2. a)** $x+2$ **b)** $4m+1$ **c)** $2s-7$ **d)** $2d-2$ **e)** $r+12$ **f)** $3t-12$ **3. a)** $7x+2$ **b)** $12y-7$ **c)** $6p^2+5p-2$ **d)** $5m^2-6mn-n^2$ **e)** $3a+3b$ **f)** $5p^2+p+3q$ **4. a)** $180\,000+170b$ **b)** \$231 000 **5. a)**  **b)** $6w+6$ **c)** $w(2w+3)$ **d)** 18 m; 14 m^2	**2**
E	**3.7 The Distributive Property Part 1** **2. a)** $8a+12$ **b)** $18b-24$ **c)** $-6m-5$ **d)** $-4r+3$ **3. a)** x^2+4x **b)** a^2-5a **c)** $-z^2+3z$ **d)** $-2b^2+b$ **4. a)** $-3w^2-5w$ **b)** $-3m^2+2m$ **c)** $12q^2+28q$ **d)** $14d^2+35d$ **5. a)** $3m+6$ **b)** $5d-15$ **c)** $-6h-10$ **d)** $-12r+3$ **6. a)** $5q-20$ **b)** $7b-42$ **c)** $-20t-28$ **d)** $-35c+15$ **7. a)** $3x^2+15x+12$ **b)** $5x^2-15x+10$ **c)** $4m^3+12m^2+20m$ **d)** $5a^3+5a^2-20a$ **e)** $3x^2+21x+9$ **8. a)** $-4x^2-4x+4$ **b)** $5a^2-5a+20$ **c)** $-r^2-r+5$ **d)** $20x+30$ **e)** $-16b+60$ **9. a)** $8x+2$ **b)** $a-23$ **c)** $1.3c-1.9$ **d)** $-22d+4$ **e)** $7k^2+3k$ **10. a)** $75+25t$, where t is the time, in hours. **b)** \$162.50 **c)** $150+50t$ **d)** \$325. Yes, the answer makes sense because it is doubled.	**2**
F	**The Distributive Property Part 2** **11. a)** $-1.8h^2-0.1h$ **b)** $6a-17$ **c)** $3r-28$ **d)** $10a^2+17a-16$ **e)** $4g^2-3g-9$ **12. a)** $14x+6$ **b)** $12x^2+9x$ **c)** Perimeter: $28x+12$, Area: $48x^2+36x$ **d)** Yes. Double the old perimeter is $2(14x+6)$ or $28x+12$. **e)** No. Double the old area is $2(12x^2+9x)$ or $24x^2+18x$, which is not equal to the new area. **13.** $SA=2lw+2hw+2lh$ **14. a)** $4x+\frac{17}{12}$ **b)** $-4a+\frac{23}{20}b$ **c)** $4m+\frac{26}{15}$ **d)** $a-\frac{23}{6}c$ **15. a)** $15x^2+24x$ **b)** $4m^2+40m$ **c)** $2a^3+30a^2$ **d)** $-14b+10$ **e)** $-y-13$ **f)** $-5c-5$	**2**

G	**One Step Equations – Addition and Subtraction** 10. x = 100 11. x = –2 12. x = –54 13. x = 14 14. x = 25 15. x = 19 16. x = 8 17. x = 9 18. x = 36 28. x = 19 29. x = 64 30. x = 33 31. x = 77 32. x = –13 33. x = 8 34. x = –49 35. x = 22 36. x = –18	**3**
H	**One Step Equations – Multiplication** 9. x = –4 10. x = –8 11. x = 33 12. x = –7 13. x = –4 14. x = –6 15. x = –11 16. x = –5 25. x = 4.43 26. x = 8.33 27. x = –2 28. x = –8 29. x = 3 30. x = –3.5 31. x = 6 32. x = –10	**3**
I	**One Step Equations – Division** 7. x = –35 8. x = –44 9. x = –18 10. x = 15 11. x = 12 12. x = 18 19. x = –20 20. x = 60 21. x = 44 22. x = –63 23. x = –50 24. x = –20	**3**
J	**Two Step Equations** 4. x = 7 5. x =5 6. x = 10 7. x = 4 8. x = 5 9. x = 25 10. x = –18 11. x = 80 22. x = 15 23. x = –7 24. x = –30 25. x = 5 26. x = –16 27. x = –2 28. x = 5	**4**
K	**4.1 Solve Simple Equations Part 1** **1. a)** $x = 3$ **b)** $y = 8$ **c)** $m = 3$ **d)** $c = 6$ **2. a)** $x = 4$ **b)** $y = 6$ **c)** $a = 5$ **d)** $b = 20$ **3. a)** $x = 3$ **b)** $g = 2$ **c)** $h = 7$ **d)** $c = -2$ **4. a)** $d = -7$ **b)** $k = 3$ **c)** $u = -4$ **d)** $w = -10$ **5. a)** $x = 2$ **b)** $w = 2$ **c)** $p = 4$ **d)** $h = -1$ **6. a)** $q = 2$ **b)** $a = 13$ **c)** $m = 2$ **d)** $b = 1$ **7. a)** $a = -10$ **b)** $c = 7$ **c)** $d = 5$ **d)** $h = -15$ **8. a)** $r = 7$ **b)** $v = -1$ **c)** $g = 1$ **d)** $j = -4$	**4**
L	**Solve Simple Equations Part 2** **9.** The variable used may vary. **a)** $15d = 120$ **b)** $d = 8$ **10. a)** $h = \frac{2}{3}$ **b)** $k = \frac{1}{5}$ **c)** $w = \frac{5}{7}$ **11. a)** $d = -\frac{1}{2}$ **b)** $r = -\frac{22}{15}$ **c)** $t = \frac{14}{15}$ **12.** Step / Explanation $5x - 4 = 6$ $5x - 4 + 4 = 6 + 4$ — Add 4 to both sides. $5x = 10$ — Simplify by adding integers. $\frac{5x}{5} = \frac{10}{5}$ — Divide both sides by 5. $x = 2$ — Divide integers to give the solution for x. **13. a)** $a = 30°$, $b = 60°$, $c = 90°$ **b)** $a = 20°$, $b = 60°$, $c = 100°$ **14.** The variable used may vary. **a)** $15n + 250 = 2000$ **b)** $n = 116.\overline{6}$; The committee can afford 116 T-shirts.	**4**

M	**Two Step Equations With Four Terms** **7.** x = –6 **8.** x = 5 **9.** x = 6 **10.** x = –6 **11.** x = –14 **12.** x = –1 **19.** x = –4 **20.** x = –12 **21.** x = 24 **22.** x = 14 **23.** x = 6.5 **24.** x = –6.8	**5**
N	**Multi-Term Equations** **1.** x = –12 **2.** x = 2 **3.** x = 22 **4.** x = –16 **5.** x = –11.5 **11.** x = 4.14 **12.** x = –2 **13.** x = 7.2 **14.** x = 4.8 **15.** x = 6.33	**5**
O	**Equations With Parentheses** **1.** x = 3 **2.** x = 6.67 **3.** x = –5.67 **4.** x = 30 **5.** x = 1.2 **11.** x = –11.33 **12.** x = –2.25 **13.** x = 0.77 **14.** x = 0.76 **15.** x = 0.33	**5**
P	**4.2 Solve Multi-Step Equations Part 1** **1. a)** $x = 2$ **b)** $y = 3$ **c)** $a = -3$ **d)** $m = 4$ **2. a)** $w = 5$ **b)** $k = -2$ **c)** $b = 1$ **d)** $d = -3$ **3. a)** $t = -5$ **b)** $c = -5$ **c)** $x = 2$ **d)** $n = 1$ **4. a)** $x = -3$ **b)** $q = 4$ **c)** $t = 7$ **d)** $u = 4$ **5. a)** $r = 2$ **b)** $y = \frac{15}{2}$ **c)** $v = -4$ **d)** $y = 2$ **6.** $x + 4x = 180°$, where x is the measure of the smaller angle, in degrees; 36°, 144° **7.** 10°, 30°, 50° **8. a)** $x = \frac{5}{3}$ **b)** $h = -\frac{3}{2}$ **c)** $m = -4$ **d)** $p = -13$	**6**
Q	**Solve Multi-Step Equations Part 2** **9.** equilateral triangle: 8, 8, 8; rectangle: 7 by 5 **10.** 108°, 36°, 36° **11.** **Step** / **Explanation** L.S. = 3(x + 4) + 6 = 3[(–3) + 4] + 6 — Substitute the root into the left side. = 3(1) + 6 — Simplify the expression inside the brackets. = 3 + 6 — Multiply. = 9 — Add. R.S. = 9 – (x + 3) = 9 – [(–3) + 3) — Substitute the root into the right side. = 9 – (0) — Simplify the expression inside the brackets. = 9 — Subtract. **14. a)** $x = -12$ **b)** $k = -\frac{10}{3}$ **c)** $m = \frac{1}{4}$ **d)** $d = \frac{3}{5}$	**6**

R	**4.3 Solve Equations Involving Fractions Part 1** **1. a)** $x=-5$ **b)** $a=-3$ **c)** $m=8$ **2. a)** $k=2$ **b)** $k=5$ **c)** $p=4$ **3. a)** $y=-7$ **b)** $p=-17$ **c)** $h=\frac{7}{4}$ **4. a)** $n=-\frac{1}{2}$ **b)** $c=-5$ **c)** $w=-11$ **5. a)** $h=9$ **b)** $d=-10$ **c)** $x=-7$ **6. a)** $p=15$ **b)** $k=-37$ **c)** $s=12$ **7. a)** $m=\frac{59}{9}$ **b)** $k=\frac{5}{2}$ **c)** $c=-\frac{13}{14}$ **d)** $n=\frac{7}{5}$ **e)** $w=17$	**7**
S	**Solve Equations Involving Fractions Part 2** **8.** 12 m **9. a)** The error is in the second line, $4(x+5)=3(x-2)$. The numerators on each side of the first line were multiplied by their own denominators. The correct step should be to multiply both sides by 12 (the lowest common denominator). **b)** The third line is incorrect. In the previous line, the denominators and the 10 were eliminated instead of being simplified. The third line should be $2(2y+4)=5(y-3)$. **10.** 18 cm **11. a)** 86°F **b)** 25°C **12. a)** $a=\frac{3}{2}$ **b)** $u=-\frac{18}{11}$ **c)** $w=\frac{57}{29}$ **13. a)** height 4.0 m; base 2.0 m **b)** 4 m^2	**7**
T	**4.4 Modelling With Formulas** **1. a)** $d=\frac{C}{\pi}$ **b)** $t=\frac{d}{v}$ **c)** $I=A-P$ **2. a)** $m=\frac{y-b}{x}$ **b)** $y=\frac{-Ax-C}{B}$ **c)** $a=\frac{F}{m}$ **d)** $R=\frac{V}{I}$ **3. a)** $s=\sqrt[3]{V}$ **b)** $R=\frac{P}{I^2}$ **c)** $h=\frac{V}{\pi r^2}$ **4. a)** $l=\frac{P-2w}{2}$ **b)** $s=\sqrt{A}$ **c)** $h=\frac{2A}{b}$ **d)** $a=\sqrt{c^2-b^2}$	**7**

U	**4.5 Modelling With Algebra** **1. a)** $4n$ **b)** $n+3$ **c)** $\frac{1}{3}n$ **d)** $3n-4$ **2. a)** $5n$ **b)** $2n+6$ **c)** $n-2$ **d)** $\frac{3}{5}n$ **3. a)** $5n = 85$; the variable n represents any number **b)** $a + 8 = 177$; the variable a represents the area **c)** $2n + 3 = 33$; the variable n represents any number **d)** $x - 1 + x + x + 1 = 168$; the variable x represents any number **4. a)** 17; this represents the number that equals 85 when multiplied by 5 **b)** 169; this represents the area that when increased by 8 equals 177 **c)** 15; this represents the number that, when multiplied by 2, is three less than 33 **d)** 56; the sum of this number and the two numbers on either side, 55 and 57, is 168 **5.** Natasha: 565; Krysten: 315 **6.** Justin: \$57.50; Kieran: \$37.50 **7.** Jacinth: 17; Naomi: 13 **8.** \$8000 **9.** 39, 40, 41 **10. a)** length = 20 m; width = 10 m **b)** 60 m **c)** 22.4 m **11.** Jessica: 20; Letitia: 40; Sally: 48	**8**
V	**Modelling With Algebra Part 2** **12. a)** $8.5t + 2m$, where t represents the time, in hours, and m represents the number of memberships. **b)** \$145 **c)** 195 **d)** 20 h **13.** Azra, \$85; Anoja, \$170; Amani, \$195 **14.** Alicia: 534 coins; Wayne 178 coins **15.** front width: 9 m; back width: 3 m **16.** triple the height **17. a)** $E = 7.5t + 0.75g$, where E represents the earnings, in dollars; t represents the time, in hours; and g represents the number of pairs of sunglasses. **b)** \$63.75 **c)** 40	**8**

W	**Chapter 4 Review Part 1** **1. a)** $x = 4$ **b)** $f = 10$ **c)** $h = 5$ **d)** $k = 12$ **2. a)** $x = 3$ **b)** $y = -1$ **c)** $f = -11$ **d)** $m = -3$ **3. a)** $x = 2$ **b)** $p = -1$ **c)** $w = -\frac{1}{3}$ **d)** $u = \frac{3}{4}$ **4. a)** $5.95 + 2.95m = 23.65$, where m represents the number of magazines John can afford. **b)** $m = 6$ **5. a)** $x = 3$ **b)** $c = 4$ **c)** $r = -5$ **d)** $g = -2$ **6. a)** $a = -1$ **b)** $b = 6$ **c)** $n = 6$ **d)** $d = -2$ **7.** 10°, 50°, 120° **8. a)** $x = 7$ **b)** $b = 26$ **c)** $m = \frac{21}{2}$ **d)** $d = -\frac{19}{3}$	**9**
X	**Chapter 4 Review Part 2** **9. a)** $r = 1$ **b)** $p = \frac{14}{5}$ **c)** $q = -7$ **d)** $b = \frac{7}{2}$ **10. a)** $x = 32$ **b)** $y = 26$ **c)** $b = -17$ **d)** $v = -27$ **11. a)** $m = \frac{F}{a}$ **b)** $I = \frac{V}{R}$ **c)** $r = \sqrt{\frac{A}{\pi}}$ **d)** $w = \frac{P - 2l}{2}$ **e)** $x = \frac{y - b}{m}$ **12. a)** 200 W **b)** 4 Ω **c)** 30 V **13.** Suresh: 13 years; Hakima: 26 years; Saad: 9 years **14. a)** \$49.50 **b)** 64 **15. a)** \$52.20 **b)** 100 **c)** 80	**9**
Y	**Factoring, Common Factors** **Factor** 1. $3x + 6$ → $3(x+2)$ 2. $4x + 6$ → $2(2x+3)$ 3. $3x - 12$ → $3(x-4)$ 4. $6x + 8$ → $2(3x+4)$ 5. $4x - 10$ → $2(2x-5)$ 6. $2x - 5xz$ → $x(2-5z)$ 7. $7y - 3yb$ → $y(7-3b)$ 8. $4a + 5ab$ → $a(4+5b)$ 9. $7b + 6bC$ → $b(7+6c)$ 10. $6c - 7cd$ → $c(6-7d)$ 11. $3a + 9a^2$ → $3a(1+3a)$ 12. $5z + 20z^2$ → $5z(1+4z)$ 13. $4y - 10y^2$ → $2y(2-5y)$ 14. $6x + 8x^2$ → $2x(3+4x)$ 15. $3y - 15y^2$ → $3y(1-5y)$ 16. $12R - 16R^2 + 8R^3$ → $4R(3-4R+2R^2)$ 17. $a^2b - ab + ab^2$ → $ab(a-1+b)$ 18. $x^3y + 2x^2y^2 - xy^3$ → $xy(x^2+2xy-y^2)$ 19. $24a^2b - 3ab + 9ab^2$ → $3ab(8a-1+3b)$ 20. $30rs - 20r^2s^2 + 40r^3s^3$ → $10rs(3-2rs+4r^2s^2)$ **Review of Common Factors** 1. $8x - 16$ → $8(x-2)$ 2. $3xy + 4x$ → $x(3y+4)$ 3. $2x^2 + 8x$ → $2x(x+4)$ 4. $6a^3 + 3a^2 - 12a$ → $3a(2a^2+a-4)$ 5. $3x + 12$ → $3(x+4)$ 6. $2x + 5xz$ → $x(2+5z)$ 7. $7x^2 + 28x$ → $7x(x+4)$ 8. $6y^3 + 9y^2 + 15y$ → $3y(2y^2+3y+5)$ 9. $8x^2 - 2x$ → $2x(4x-1)$ 10. $12x^3 + 8x^2 - 4x$ → $4x(3x^2+2x-1)$ 11. $8 + 8a$ → $8(1+a)$ 12. $4bx - 5b$ → $b(4x-5)$ 13. $4y^2 - 14y$ → $2y(2y-7)$ 14. $7y - 8ay$ → $y(7-8a)$ 15. $a^3b - 3a^2b^2 - ab^3$ → $ab(a^2-3ab-b^2)$ 16. $3a^3 - 75a$ → $3a(a^2-25)$	**10**