Some solutions for 3.3 Practice.

1. a) $\frac{1}{4}(x-3) = -2$ multiply both side by 4

$x - 3 = -8$ add 3 to both sides

$+3 \quad +3$

$\boxed{x = -5}$

b) $6 = \frac{-3}{5}(a-7)$ multiply both sides by 5

$30 = -3(a-7)$ divide both sides by -3

$\div -3 \quad \div -3$

$-10 = a - 7$ add 7 to both sides

$+7 \quad +7$

$-3 = a.$

$\boxed{a = -3}$

c) $\frac{m+7}{5} = 3$ multiply both sides by 5

$m + 7 = 15$ subtract 7 from both sides

$-7 \quad -7$

$\boxed{m = 8}$

2. a) $9 = \frac{3(k+4)}{2}$ multiply both sides by 2.

$18 = 3(k+4)$ $\div 3$

$\div 3 \quad \div 3$

$6 = k + 4$ -4

$-4 \quad -4$

$\boxed{2 = k}$

2b) $\frac{3k+5}{2} = 10$ x by 2.

$3k+5 = 20$ sub. 5

$-5 \quad -5$

$3k = 15$ ÷ 3

$\div 3 \quad \div 3$

$\boxed{k = 5}$

c) $1 = \frac{2p-3}{5}$ x by 5

$5 = 2p - 3$ + 3

$+3 \quad +3$

$8 = 2p$ ÷ 2

$\div 2 \quad \div 2$

$\boxed{4 = p}$

3a) $\frac{y-5}{3} = -4$ x 3

$y - 5 = -12.$ + 5

$+5 \quad +5$

$\boxed{y = -7}$

b) $\frac{1}{3}(p+2) = -5$ x 3

$p + 2 = -15$ − 2

$-2 \quad -2$

$\boxed{p = -17}$

c) $3 = \frac{4}{5}(h+2)$ x 5

$15 = 4(h+2)$ ÷ 4

$\frac{15}{4} = h+2$ − 2

$3.75 = h + 2$

$-2 \quad -2$

$\boxed{1.75 = h}$ or $\boxed{\frac{7}{4}}$

#4. a) $\frac{5 = 4(n+3)}{2}$ $\times 2$

$10 = 4(n+3)$ $\div 4$

$\frac{10}{4} = n+3$

$2.5 = n+3$ -3

$-3 \quad -3$

$\boxed{-0.5 = n}$

b) $\frac{6 = 7-c}{2}$ $\times 2$

$12 = 7 - c$ -7

$-7 \quad -7$

$5 = -c$ $\div -1$

$\boxed{-5 = c}$

c) $\frac{3+w}{-2} = 4$ $\times(-2)$

$3+w = -8$ -3

$-3 \quad -3$

$\boxed{w = -11}$

5. a) $\frac{h-4}{5} = \frac{h-3}{6}$ $\times$ LS by 6, RS by 5

$6(h-4) = 5(h-3)$

$6h - 24 = 5h - 15$ move 24 to RS

$+24 \quad +24$

$6h = 5h + 9$ move 5h to LS

$-5h \quad -5h$

$1h = 9$

$\boxed{h = 9}$

5b) $\frac{d-2}{4} = \frac{d+1}{3}$ × LS by 3, RS by 4

$3(d-2) = 4(d+1)$

$3d - 6 = 4d + 4$ add 6

$+6 \qquad +6$

$3d = 4d + 10$ $-4d$

$-4d \quad -4d$

$-1d = 10$

$\boxed{d = -10}$

c) $\frac{1}{3}(x+4) = \frac{1}{5}(x+2)$

same as $\frac{x+4}{3} = \frac{x+2}{5}$ × LS by 5, RS by 3

$5(x+4) = 3(x+2)$

$5x + 20 = 3x + 6$ -20

$-20 \qquad -20$

$5x = 3x - 14$ $-3x$

$-3x \quad -3x$

$\frac{2x}{2} = \frac{-14}{2}$ $\div 2$

$\boxed{x = -7}$

#6 a) $\frac{1}{4}(p-7) = \frac{1}{6}(p-3)$ × LS by 6, × RS by 4

$6(p-7) = 4(p-3)$

$6p - 42 = 4p - 12$ +42

$+42 \quad +42$

$6p = 4p + 30$ −4p

$-4p \quad -4p$

$2p = 30$ ÷2

$\frac{2p}{2} = \frac{30}{2}$

$\boxed{p = 15}$

b) $\frac{2(k-5)}{3} = \frac{4(k+2)}{5}$ × LS by 5, × RS by 3.

$5(2(k-5)) = 3(4(k+2))$

$5(2k-10) = 3(4k+8)$

$10k - 50 = 12k + 24$ +50

$+50 \quad +50$

$10k = 12k + 74$ −12k

$-12k \quad -12k$

$\frac{-2k}{-2} = \frac{74}{-2}$ ÷ −2

$\boxed{k = -37}$

6c). $\frac{3(s-4)}{4} = \frac{2(s-3)}{3}$ × LS by 3, RS by 4.

$3(3(s-4)) = 4(2(s-3))$

$3(3s-12) = 4(2s-6)$

$9s - 36 = 8s - 24$ +36

+36 +36

$9s = 8s + 12$ −8s

−8s −8s

$1s = 12$

$\boxed{s = 12}$

7a) $\frac{2(3m+2)}{5} = \frac{3}{4}(m+5)$ × LS by 4, RS by 5

$4(2(3m+2)) = 5(3(m+5))$

$4(6m+4) = 5(3m+5)$

$24m + 16 = 15m + 25$ −16

−16 −16

$24m = 15m + 9$ −15m

−15m −15

5

$4(2(3m+2)) = 5(3(m+5))$

$4(6m+4) = 5(3m+15)$

$24m + 16 = 15m + 75$

$-15m \qquad -15m$

$9m + 16 = 75$

$-16 \qquad -16$

$9m = 59$

$\boxed{m = \frac{59}{9}}$

$\frac{2}{3}(k+2) = \frac{3}{4}(2k-1)$.

$4(2(k+2)) = 3(3(2k-1))$

$4(2k+4) = 3(6k-3)$

$8k + 16 = 18k - 9$

$-16 \qquad +16$

$8k = 18k - 25$

$-18k \qquad -18k$

$-10k = -25$

$k = \frac{-25}{-10} = \boxed{\frac{5}{2}}$

c) $\frac{4c+5}{3} = \frac{5(2c+4)}{5}$

$5(4c+5) = 3(2c+4)$

$20c + 25 = 6c + 12$

$-25 \quad\quad -25$

$20c = 6c - 13$

$-6c \quad\quad -6c$

$14c = -13$

$\boxed{c = \frac{-13}{14}}$

d) $\frac{5-3n}{4} = \frac{2-n}{3}$

$3(5-3n) = 4(2-n)$

$15 - 9n = 8 - 4n$

$-15 \quad\quad -15$

$-9n = -7 - 4n$

$+4n \quad\quad +4n$

$-5n = -7$

$n = \frac{-7}{-5} = \boxed{\frac{7}{5}}$

e) $\frac{2(3w+4)}{5} = \frac{2(2w-1)}{3}$

$3(2(3w+4)) = 5(2(2w-$

$3(6w+8) = 5(4w-$

$18w + 24 = 20w - 10$

$-24 \quad\quad -24$

$18w = 20w - 34$

$-20w \quad\quad -20w$

$\frac{-2w}{-2} = \frac{-34}{-2}$

$\boxed{w = 17}$

8. area trapezoid $= \frac{(a+b)h}{2}$

$96 = \frac{(6+10)h}{2}$ $(\times 2)$

$192 = 16h$ $\div 16$

$\boxed{h = 12}$ m.

9. a) $\frac{x+5}{4} = \frac{x-2}{3}$

$4(x+5) = 3(x-2)$ → they multiplied wrong way

→ should be

$3(x+5) = 4(x-2)$

b) $\frac{1}{5}(2y+4) = \frac{1}{2}(y-3)$

$10 \times \frac{1}{5}(2y+4) = 10 \times \frac{1}{2}(y-3)$ → they made an error here (didn't divide 10 by 5 and 2)

$= 2(2y+4) = 5(y-3)$

10. $A = \frac{b \times h}{2}$

$72 = \frac{b \times 8}{2}$ $(\times 2)$

$144 = b \times 8$ $(\div 8)$

$\boxed{18 = b}$

$\boxed{b = 18\text{cm}}$

11. $F = \frac{9}{5}C + 32$

a) $F = \frac{9(30)}{5} + 32$

$= \frac{270}{5} + 32$

$= 54 + 32$

$= 86°F.$

b) $77 = \frac{9}{5}C + 32$

$-32 \qquad -32$

$45 = \frac{9C}{5} \qquad \times 5$

$\frac{225}{9} = \frac{9C}{9} \qquad \div 9$

$C = 25°C.$

12a) $\frac{2a}{3} + \frac{a-4}{5} = \frac{1}{2}.$ Common value = 30

$30\left(\frac{2a}{3}\right) + 30\frac{(a-4)}{5} = \frac{30}{2}$

$10(2a) + 6(a-4) = 15$

$20a + 6a - 24 = 15$

$26a - 24 = 15 \qquad +24$

$+24 \qquad +24$

$26a = 39 \qquad \div 13$

$a = \frac{39}{26} \div 13 = \boxed{\frac{3}{2}}$

12 b) $\frac{u+1}{2} + \frac{2u+3}{3} = \frac{u}{4}$ common

$12\frac{(u+1)}{2} + 12\frac{(2u+3)}{3} = \frac{12u}{4}$

$6(u+1) + 4(2u+3) = 3u.$

$6u+6 + 8u + 12 = 3u.$

$14u + 18 = 3u.$

$-14u \qquad -14u$

$18 = -11u$ or $-11u = 18$

$\boxed{u = -\frac{18}{11}}$

c) $\frac{w+3}{4} = \frac{w}{3} + \frac{2w-1}{5}$ common = 60

$\frac{60(w+3)}{4} = \frac{60w}{3} + \frac{60(2w-1)}{5}$

$15(w+3) = 20w + 12(2w-1)$

$15w + 45 = 20w + 24w - 12$

$15w + 45 = 44w - 12$

$-45 \qquad -45$

$15w = 44w - 57$

$-44w \qquad -44w$

$-29w = -57$

$\boxed{w = \frac{57}{29}}$