

## Worksheet #27—Harder Linear Equation Problems

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Solve each of the following for the indicated variable.

- (1)  $x(a + b) = c$  for  $c$                       (2)  $ax - bx = c$  for  $x$                       (3)  $f = \frac{1}{2}(c - 1)$  for  $c$
- (4)  $ax = bx + a$  for  $x$                       (5)  $2(a + b) = ac$  for  $a$                       (6)  $13.8 - 1.3x = 4.3 + 1.2x$
- (7)  $2(a - 2) = 3(b - 1)$  for  $b$                       (8)  $x(a + b) = x + 1$  for  $x$                       (9)  $a(x + y) = b(x + y)$  for  $y$
- (10)  $x + 2 = ax + y$  for  $x$                       (11)  $a - a(b + c) = 3$  for  $a$                       (12)  $\frac{2}{3}x - \frac{1}{3} = 3$
- (13)  $3(x - 1) = 2(x + 1)$                       (14)  $3(x + a) = x$  for  $x$                       (15)  $\frac{2a - 1}{3b - 1} = 2$  for  $b$
- (16)  $\frac{ax}{b} = \frac{a}{c}$  for  $x$                       (17)  $3 - 3(y - 2) = 5 + 2$                       (18)  $ab + cd = ad + bc$  for  $c$
- (19)  $(a + b)(x + y) = 1$  for  $x$                       (20)  $ay + b = cy - d$  for  $y$                       (21)  $3 - 2(x - 1) = 2(x + 1) - 3$
- (22)  $mx + b = nx + c$  for  $x$                       (23)  $T = C + 10(B - A)$  for  $A$                       (24)  $0.3(0.2x - 1) = 1.44$
- (25)  $x(a - b) = m(x - c)$  for  $x$                       (26)  $\frac{x}{a} = \frac{a}{b}$  for  $x$                       (27)  $\frac{1}{a + 1} = \frac{1}{2a - 1}$
- (28)  $A = \frac{1}{2}h(b_1 + b_2)$  for  $h$                       (29)  $x(a - b) = m(x - c)$  for  $x$                       (30)  $\frac{a}{b} = \frac{c}{d}$  for  $d$
- (31)  $\frac{x}{a} + \frac{y}{b} = 1$                       (32)  $5 - 3(x - 1) = x - 1$                       (33)  $a = \frac{1}{b} + \frac{1}{c}$  for  $b$
- (34)  $\frac{x + 1}{2} = \frac{3x - 1}{a}$                       (35)  $c(z - b) = b + c$  for  $z$                       (36)  $A = \frac{1}{2}(b + B)h$  for  $h$
- (37)  $\frac{a + 2}{a} = \frac{2}{3}$                       (38)  $\frac{2}{3}y = \frac{y}{3} - 1$                       (39)  $y - a = m(x - b)$  for  $x$
- (40)  $2(x + 2) - 4 = 2x$                       (41)  $A = \frac{1}{2}(b + B)h$  for  $B$                       (42)  $x(a + b) = a + c$  for  $x$
- (43)  $x(a + b) = c + d$  for  $x$                       (44)  $\frac{a}{b} + \frac{c}{d} = 0$  for  $c$                       (45)  $\frac{x}{a} + \frac{y}{b} = 1$  for  $y$
- (46)  $a - b - c = ab$  for  $b$                       (47)  $ab + bc = cd$  for  $c$                       (48)  $\frac{1}{R} = \frac{1}{r_1} + \frac{1}{r_2}$  for  $r_1$

Answers: (1)  $c = (b + a)x$  (2)  $x = \frac{c}{-b + a}$  (3)  $c = 2f + 1$  (4)  $x = \frac{a}{a - b}$  (5)  $a = \frac{2b}{c - 2}$

(6)  $x = 3.8$  (7)  $b = \frac{2a - 1}{3}$  (8)  $x = \frac{1}{b + a - 1}$  (9)  $y = -x$  (10)  $x = \frac{2 - y}{a - 1}$  (11)  $a = \frac{-3}{c + b - 1}$

(12)  $x = 5$  (13)  $x = 5$  (14)  $x = \frac{-3a}{2}$  (15)  $b = \frac{2a + 1}{6}$  (16)  $x = \frac{b}{c}$  (17)  $y = \frac{2}{3}$

(18)  $c = a$  (19)  $x = \frac{1 - by - ay}{b + a}$  (20)  $y = \frac{d + b}{c - a}$  (21)  $x = \frac{3}{2}$  (22)  $x = \frac{b - c}{n - m}$

(23)  $A = \frac{10B + C - T}{10}$  (24)  $x = 29.$  (25)  $x = \frac{cm}{m + b - a}$  (26)  $x = \frac{a^2}{b}$  (27)  $a = 2$

(28)  $h = \frac{2A}{b_1 + b_2}$  (29)  $x = \frac{cm}{m + b - a}$  (30)  $d = \frac{bc}{a}$  (31)  $a = \frac{bx}{b - y}$  (32)  $x = \frac{9}{4}$

(33)  $b = \frac{c}{ac - 1}$  (34)  $x = \frac{a + 2}{-a + 6}$  (35)  $z = \frac{b}{c} + b + 1$  (36)  $h = \frac{2A}{B + b}$  (37)  $a = -6$

(38)  $y = -3$  (39)  $x = \frac{y + bm - a}{m}$  (40) All real numbers (41)  $B = \frac{2A - bh}{h}$  (42)  $x = \frac{c + a}{b + a}$

(43)  $x = \frac{d + c}{b + a}$  (44)  $c = -\frac{ad}{b}$  (45)  $y = \frac{ba - bx}{a}$  (46)  $b = \frac{a - c}{a + 1}$  (47)  $c = \frac{ab}{d - b}$

(48)  $r_1 = \frac{r_2 R}{R - r_2}$