GRADE 10_CAPS Curriculum

10.4 Equations and inequalities (B)

1. Solve the equations simultaneously.

(a) $-9(r + 4) = r + 14$ and $r + 8e + 3 = 46$

(b) $t - 6f - 5 = -23$ and $-5(t + 4) = t + 16$

(c) $8(x + 7) = 2x + 80$ and $3x + 5f = -3x + 49$

(d) $-6f - 6y = 60$ and $4f + 2y = -24$

(e) $-4n + 4r = 8$ and $-4nr = -12$

2. Solve literal equations by changing the subject to the indicated letter.

(a) $y + \frac{f}{e} = r$ ..... (f)

(b) $px + y = f$ .....(p)

(c) $-n + (e + 3)m = x$ .....(e)

(d) $\frac{f}{4}(m^2 + r) = z$ .....(m)

3. Solve linear inequalities.

(a) $\frac{r}{2} > -5r - 1$

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

(c) $\frac{6c - 11}{5} < 7(c - 1)$

(d) $84 > 8v - 4 > 76$

(e) $-13 > 12f + 11 > -181$

MEMO

1. Solve the equations simultaneously. [4.6.1.2; 4.6.1.3; 4.6.2.1; 4.6.2.2]

(a) $-9(r + 4) = r + 14$ ....(1)
$-9r - 36 = r + 14$
$-9r - r = 36 + 14$
$-10r = 50$
$r = -5$

$r + 8e + 3 = 46$ ....(2)
$(-5) + 8e + 3 = 46$
$8e = 46 - 3 + 5$
$8e = 48$
$e = 6$

(b) $-5(t + 4) = t + 16$ ....(1)
$-5t - 20 = t + 16$
$-5t - t = 16 + 20$
$-6t = 36$
$t = -6$

$t - 6f - 5 = -23$....(2)
$(-6) - 6f - 5 = -23$
$-6f = -23 + 6 + 5$
$-6f = -12$
$f = 2$

(c) $8(x + 7) = 2x + 80$....(1)
$8x + 56 = 2x + 80$
$8x - 2x = -56 + 80$
$6x = 24$
$x = 4$

$3x + 5f = -3x + 49$....(2)
$3(4) + 5f = -3(4) + 49$
$12 + 5f = -12 + 49$
$5f = -12 + 49 - 12$
$5f = 25$
$f = 5$

(d) $-6f - 6y = 60$....(1)
$-f - y = 10$
$-y = 10 + f$
$y = -10 - f$

$4f + 2y = -24$....(2)
$4f + 2(-10 - f) = -24$
$4f - 20 - 2f = -24$
$2f = 20 - 24$
$2f = -4$
$f = -2$

(e) $-4n + 4r = 8$ ....(1)
$n - r = -2$
$n = r - 2$

$-4nr = -12$....(2)
$-4(r - 2)r = -12$
$-4r + 8r = -12$
$4r = -12$
$r = -3$

2. Solve literal equations by changing the subject to the indicated letter. [4.2.4.1; 4.2.4.2;4.2.4.3]

(a) $y + \frac{f}{e} = r$ ..... (f)

$$y+\frac{f}{e}=r$$
$$ey+f=er$$
$$f=er-ey$$

(b) $px+y=f$ .....(p)

$$px+y=f$$
$$px=f-y$$
$$p=\frac{f-y}{x}$$

(c) $-n+(e+3)m=x$.....(e)

$$-n+(e+3)m=x$$
$$-n+em+3m=x$$
$$em=n-3m+x$$
$$e=\frac{n-3m+x}{m}$$

(d) $\frac{f}{4}(m^2+r)=z$ .....(m)

$$\frac{f}{4}(m^2+r)=z$$
$$f(m^2+r)=4z$$
$$fm^2+fr=4z$$
$$fm^2=4z-fr$$
$$m^2=\frac{4z-fr}{f}$$
$$m=\pm\sqrt{\frac{4z-fr}{f}}$$

3. Solve linear inequalities. [5.3.1.1; 5.3.1.4]

(a)

$$\frac{r}{2} > -5r - 1$$
$$r > -10r - 2$$
$$11r > -2$$
$$r > \frac{-2}{11}$$

(b)

$$\frac{-2y}{5} \leq 3y + 4$$
$$-2y \leq 15y + 20$$
$$-2y - 15y \leq 20$$
$$-17y \leq 20$$
$$y \geq \frac{-20}{17}$$

(c)

$$\frac{6c - 11}{5} < 7(c - 1)$$
$$6c - 11 < 35(c - 1)$$
$$6c - 11 < 35c - 35$$
$$6c - 35c < 11 - 35$$
$$-29c < -24$$
$$c > \frac{24}{29}$$

(d)

$$84 > 8v - 4 > 76$$
$$84 + 4 > 8v > 76 + 4$$
$$88 > 8v > 80$$
$$11 > v > 10$$

(e)

$$-13 > 12f + 11 > -181$$
$$-13 - 11 > 12f > -181 - 11$$
$$-24 > 12f > -192$$
$$-12 > f > -16$$