SHARP

Worksheet 6 – Equations and Inequalities

Grade 10 – Mathematics

1. Solve each of the following equations for x:

a) $-2x + 6 = 18$

b) $3(x - 1) = 6$

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

d) $11x - \frac{1}{2} = -121\frac{1}{2}$

e) $\frac{x}{3} + 4 = \frac{x}{2} - 5$

f) $2(x - 3) + 3(2x + 8) = -3(x - 8)$

g) $\frac{x+3}{5} = \frac{x+1}{2}$

h) $\frac{3}{x} + 7 = 10$

i) $-\frac{1}{4}x + \frac{3x}{5} = 2.1$

j) $\frac{3}{4}(x - 2) = \frac{4}{3}(x + 7)$

k) $\frac{2}{x-2} + \frac{3}{x+2} = \frac{4}{x-2}$

l) $\frac{7}{(x-1)(x+3)} = \frac{4}{x+3}$

m) $\frac{3x+4}{(x-2)(x+2)} = \frac{7}{x-2}$

n) $\frac{3-2x}{(x-1)(3x-16)} + \frac{5}{x-1} = 0$

o) $\frac{3(x-4)(x+2)}{(x-4)(x-2)} = \frac{4}{x-2}$

2. Make the variable given after each equation the subject of the formula:

a) $V = \pi r^2 h$ for h

b) $V = \pi r^2 h$ for r

c) $A = P(1 + in)$ for i

d) $A = P(1 + i)^n$ for i

e) $3 = \frac{-b+\sqrt{b^2-4ac}}{2a}$ for c

f) $s = ut + \frac{1}{2}at^2$ for a

g) $s = ut + \frac{1}{2}at^2$ for u

h) $SA = 2(lb + lh + bh)$ for h

i) $0 = ax^2 + bx + c$ for a

j) $T_n = a(r)^{n-1}$ for r

3. Solve the following equations for x:

a) $(4x - 1)(x - 3) = -7$

b) $x^2 - x - 12 = 0$

c) $(3x - 5)(x + 2) = 0$

d) $x^2 - 4x = -4x + 9$

e) $(x - 7)(x + 5) = -11$

f) $x^2 - 8x + 15 = 0$

g) $x^2 + 13x + 40 = 0$

h) $(x - 4)(x + 3) - 8 = 0$

i) $4\left(x^2 - 2x + \frac{1}{2}\right) = x$

j) $(2x + 1)(x - 2) - 7 = 0$

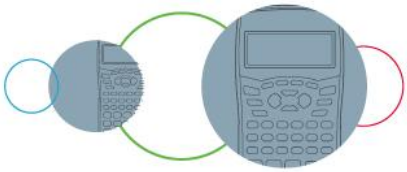
k) $4x^2 - 8x - 32 = 0$

l) $3x^2 - 14x - 5 = 0$

m) $(3x - 8)(x + 2) = -8$

n) $4x^2 - 8x - 5 = 0$

o) $x(x + 7) + 10 = 0$



4. Solve the following equations for x and y:

a) $y = 3x + 4$ and $y = -3x - 4$

b) $y = \frac{1}{4}x + 2$ and $y = 2x - 7$

c) $y = x$ and $y = \frac{2}{3}x - 1$

d) $2y = -x + 2$ and $y - x = 4$

e) $x - 3y = 4$ and $x = 7y + 3$

f) $2x = \frac{1}{3}y - 8$ and $y = x + 9$

g) $-3x + 6 = 2y$ and $y - x = 4$

h) $x - 3y - 5 = 0$ and $2x + 3y + 8 = 0$

i) $y - \frac{3}{5}x + 9 = 0$ and $\frac{1}{3}y = \frac{2}{3}x - 3$

j) $5y - 3 = \frac{1}{2}x$ and $9y = 4x - 7$

5. Solve for x:

a) $3x + 4 < 5$

b) $x - \frac{1}{2} \geq 3$

c) $2(x - 6) > 0$

d) $5x + 4 \leq 3(x - 1)$

e) $\frac{x}{3} \geq \frac{x-1}{4}$

f) $\frac{x+2}{5} - \frac{x-3}{2} \geq 0$

g) $3(x - 5) + 4(x - 2) \leq -2$

h) $\frac{x-1}{4} - 9 > \frac{x+3}{2}$

i) $3(x + 6) < 2\frac{2}{3}$

j) $\frac{x+1}{5} - \frac{2-x}{3} \leq \frac{3+x}{2}$

6. George travels to Cape Town from Beaufort West in x hours over a distance of 507km. When he travels back it takes him $x - 1$ hours. How many hours (rounded to the nearest hour) did it take George to travel to and from Cape Town if his average speed for the entire trip was 116km/h?

7. Sara goes to the café and buys three chocolate milkshakes and two toasted sandwiches which cost her R104 in total. The next day Sindiswa goes to the café and buys 4 toasted sandwiches and 5 chocolate milkshakes which cost her R190. How much does a milkshake cost and how much does a toasted sandwich cost?

8. Sipho wants to build a fence around his garden whose perimeter is 140m. If the length of garden is x m and the breadth of the garden is $x + 4$m, determine the length and breadth of the garden.

9. Janice wants to paint a round plate, if the circumference ($2\pi r$) of the plate is 31.416cm, determine the value of the radius.