SHARP

Worksheet 17: Algebraic Equations

Grade 9 Mathematics

1. Solve the following linear equations for x:

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

   b) $7x + 3(x - 5) = 0$

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

   d) $3x + 9 = 4(x - 2)$

   e) $\frac{1}{3}(x - 2) = 2x - 6$

   f) $4(x - 7) + 6(2 - 3x) = 5(x - 6)$

   g) $-3x(x + 7) = (3x + 4)(4 - x)$

   h) $12x + 17 + x^2 = 2\left(\frac{1}{2}x - 4\right)(x + 3)$

   i) $\frac{x+3}{3} - \frac{2x-7}{4} = 12$

   j) $\frac{x-1}{6} + 4 = \frac{x-1}{4} - \frac{3x-5}{2}$

2. Solve the following quadratic equations for x:

   a) $(x - 7)(x + 8) = 0$

   b) $x^2 + 5x + 4 = 0$

   c) $x^2 + 3\frac{1}{3}x + 1 = 0$

   d) $x^2 + x - 30 = 0$

   e) $x^2 - 2x - 24 = 0$

   f) $x^2 - 9x + 20 = 0$

   g) $x^2 - 17x + 16 = 0$

   h) $x^2 - 14x + 40 = 0$

   i) $x^2 + 10x + 21 = 0$

   j) $x^2 = 36$

   k) $x^2 - 6x = 0$

   l) $x^2 + x + \frac{1}{4} = 0$

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

   n) $2x^2 - 14x + 12 = 0$

   o) $x^2 + 30 - 13x = 0$

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

   q) $x^2 + 17x + 52 = 0$

   r) $x^2 + 12x - 45 = 0$

   s) $x^2 - 19x + 84 = 0$

   t) $\frac{1}{4}x^2 + 4x + 16 = 0$

   u) $(x + 2)(x + 7) = -4$

   v) $(x - 3)(x - 4) = 30$

   w) $(x + 7)(x - 6) = 14$

   x) $x^2 - 8 = 1$

3.   Solve the following exponential equations for x:

a) $2^x = \frac{1}{4}$

b) $x^3 = 343$

c) $\frac{1}{3} \cdot 6^x + 1 = 13$

d) $x = 15^6$

e) $x^{\frac{1}{2}} = 8$

f) $x = (8)^{\frac{2}{3}}$

g) $5^{x+2} - 3 = 2$

h) $x^4 = 2\,401$

i) $x = 3^3 \times 2^{-3}$

j) $2.3^x - 4 = 50$

4.   Jill runs to the shops to buy a bar of chocolate. It takes her three times as long to get home because she is eating her chocolate. How fast does Jill walk to the shops, if Jill lives 500m from the shops and it took her 25 minutes to go there and back.

5.   Thando's dad is three times as old as she is now. Ten years ago he was seven times as she was old then. How old are Thando and her dad now?

6.   A rental car has a once off fee of R175, and a daily rate of R120. How many days was the rental car rented for if Tina pays R1 255 for the entire rental period?

7.   You are in the middle of a zombie apocalypse. The distance to nearest safe house is 100m. For every meter that you run, there will be $3x - 2$ zombies chasing you. How many zombies will be chasing you by the time you reach the safe house?

8.   Hashim Amla, scores an average of 25 ½ runs per match, over 80 matches. How many runs has Amla scored in total?

9.   *Class Exercise: Set up your own story sum using your name and your dad or mom. Find a mathematical way to relate your ages now, and at some time in the future or past.

a)   Ask the person next to you to solve your story sum.

b)   What are some of the steps that you used in setting up your story sum, that you could use in solving other story sums?