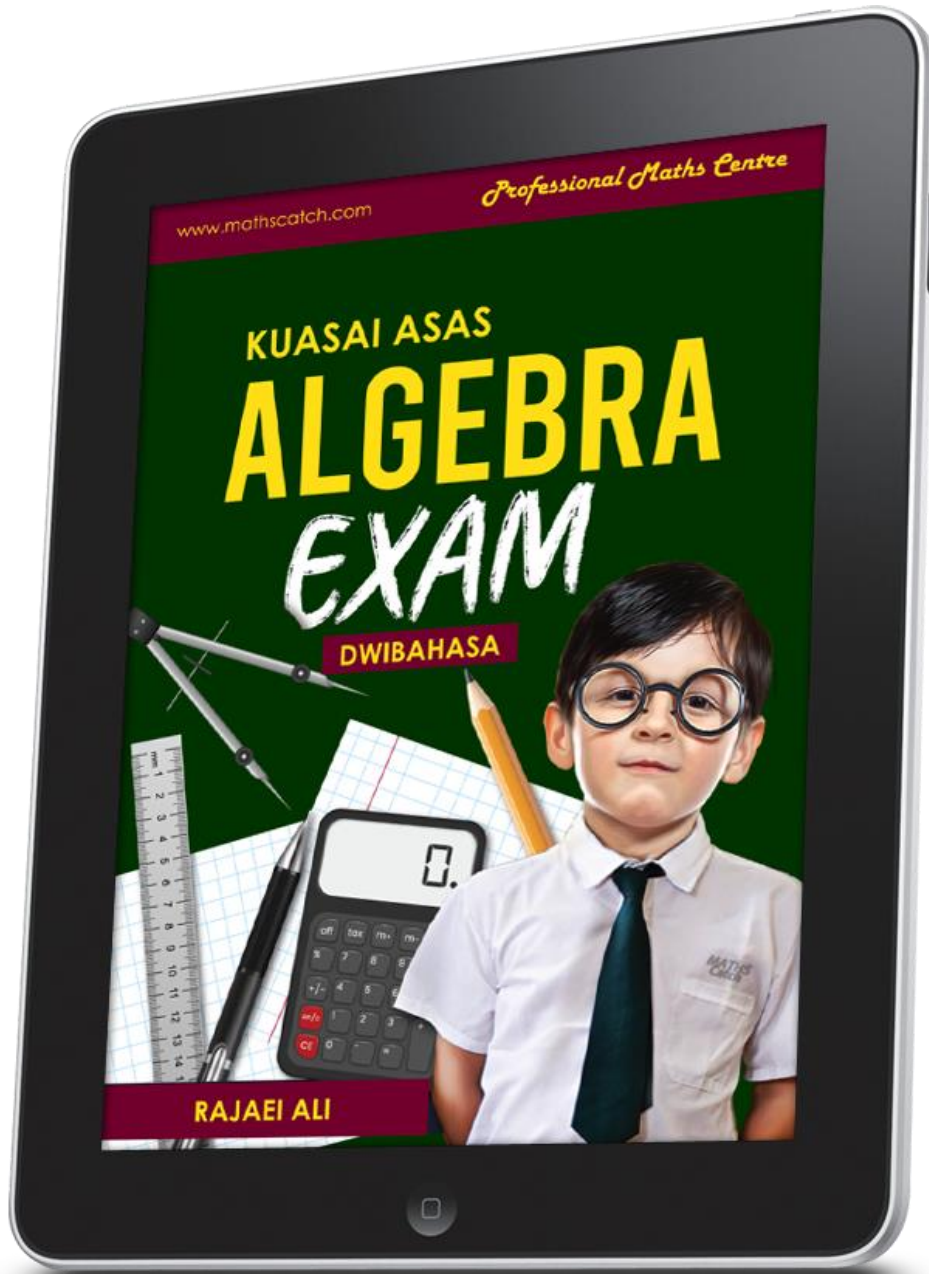


TINGKATAN 123



P/s: Modul Latihan asas algebra ni sesuai untuk pelajar Tingkatan 123. Modul ini saya gunakan kepada murid-murid saya di Maths Catch Centre untuk tujuan mengesan kelemahan asas matematik mereka dengan pantas.

LATIHAN ASAS MATEMATIK ALGEBRA

ALGEBRA – UNGKAPAN

ALGEBRA – PERSAMAAN LINEAR

BACK TO BASIC - JSU

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1. (a) Tambah $(-4y - 5y - 3)$ kepada $(3y + 2y - 2)$.
Add $(-4y - 5y - 3)$ to $(3y + 2y - 2)$.

Jawapan/Answer:

- (b) Tolak $6k$ daripada $(-8k - 4)$.
Subtract $6k$ from $(-8k - 4)$.

Jawapan/Answer:

- (c) Permudahkan $2q - 4 + 6 - 10q$.
Simplify $2q - 4 + 6 - 10q$.

Jawapan/Answer:

- (d) Permudahkan $6k - \frac{2}{5}k - \frac{4}{7}k + 6$.
Simplify $6k - \frac{2}{5}k - \frac{4}{7}k + 6$.

Jawapan/Answer:

2. (a) Permudahkan setiap yang berikut.

Simplify each of the following.

(i) $7x + 10 + 11x + 2$

(ii) $-10y + 10 - 4y - 8y - 1$

Jawapan/Answer:

- (b) Permudahkan setiap yang berikut.

Simplify each of the following.

(i) $\frac{3m}{2} - \frac{3}{8}m$

(ii) $-16n - n - 20 - 13$

Jawapan/Answer:

- (c) $3\frac{1}{2}x - \frac{1}{4}x$

Jawapan/Answer:

- (d) Nyatakan sama ada setiap yang berikut merupakan satu ungkapan algebra.

State whether each of the following is an algebraic expression.

(i) 8

(ii) $5x - 2y + 1$

Jawapan/Answer:

3. (a) Permudahkan setiap yang berikut.

Simplify each of the following.

(i) $7st \times (3t)^2$

(ii) $-9p^2q \div (-5pq)$

Jawapan/Answer:

- (b) Permudahkan $-8p \times 7p^2q^2 \times 10pq^2$.

Simplify $-8p \times 7p^2q^2 \times 10pq^2$. Jawapan/Answer:

- (c) Permudahkan $\frac{(-9m^3n^5) \times 7mn^2}{-5mn^4}$.

Simplify $\frac{(-9m^3n^5) \times 7mn^2}{-5mn^4}$. Jawapan/Answer:

- (d) Permudahkan $10s^3u \times 6st \div 6stu$.

Simplify $10s^3u \times 6st \div 6stu$. Jawapan/Answer:

4. (a) Permudahkan $\frac{(-2x^5z)(6xy)}{-6xyz}$.

Simplify $\frac{(-2x^5z)(6xy)}{-6xyz}$. Jawapan/Answer:

(b) Diberi $s = 4$ dan $t = -5$, hitung nilai $\frac{6s + 6t^2}{7}$.

Given that $s = 4$ and $t = -5$, calculate the value of $\frac{6s + 6t^2}{7}$. Jawapan/Answer:

(c) Diberi $x = \frac{2}{3}$ dan $y = 3$, hitung nilai $-2x(6y - 10)^3$.

Given that $x = \frac{2}{3}$ and $y = 3$, calculate the value of $-2x(6y - 10)^3$. Jawapan/Answer:

(d) Diberi $m = 3$ dan $n = -3$, hitung nilai $-10m^2 + 5n^2$.

Given that $m = 3$ and $n = -3$, calculate the value of $-10m^2 + 5n^2$. Jawapan/Answer:

5. (a) Diberi $m = 4$ dan $n = 4$, hitung nilai $\frac{-7m}{8n} - (-2n)^3$.

Given that $m = 4$ and $n = 4$, calculate the value of $\frac{-7m}{8n} - (-2n)^3$. Jawapan/Answer:

(b) Diberi $x = -3$ dan $y = 1$, hitung nilai $\frac{3x^2 + 3y^3}{2x - 2y}$.

Given that $x = -3$ and $y = 1$, calculate the value of $\frac{3x^2 + 3y^3}{2x - 2y}$. Jawapan/Answer:

(c) Permudahkan $-10p + 3q + 4p + 10q$.

Simplify $-10p + 3q + 4p + 10q$.

Jawapan/Answer:

(d) Permudahkan setiap yang berikut.

Simplify each of the following.

(i) $4p + 9p(-3 + 3q) + 9pq$

(ii) $(4x^3 + 4xy) \div 6$

Jawapan/Answer:

6. (a) Permudahkan $\frac{10m - 9(-6m - 9)}{2} - 6$.

Simplify $\frac{10m - 9(-6m - 9)}{2} - 6$. Jawapan/Answer:

(b) Permudahkan setiap yang berikut.

Simplify each of the following.

(i) $7(3m - 7)$

(ii) $(12x^3 + 20xy + 12) \div 4$

Jawapan/Answer:

(c) Ringkaskan:

Simplify:

(i) $2x - (y + 2x)$

(ii) $\frac{12x \times 5yz}{3xy}$

Jawapan/Answer:

(d) Permudahkan ungkapan yang berikut.

Simplify each of the following expression.

(i) $\frac{-20m - 8}{4}$

(ii) $\frac{4x - 1}{16x^2 - 1}$

Jawapan/Answer:

7. (a) Selesaikan setiap persamaan berikut.
Solve each of the following equations.

(i) $\frac{3p}{4} = 3$

(ii) $9(q - 1) = 7q + 5$

Jawapan/Answer:

- (b) Selesaikan persamaan-persamaan berikut.
Solve the following equations.

(i) $x = 4x - 6$

(ii) $5y = \frac{6 - 7y}{7}$

Jawapan/Answer:

8. (a) Diberi $3q = 84 - 3q$, cari nilai bagi q .
Given that $3q = 84 - 3q$, find the value of q .

Jawapan/Answer:

- (b) Diberi $6b - 6 = 8b + 5$, cari nilai bagi b .
Given that $6b - 6 = 8b + 5$, find the value of b .

Jawapan/Answer:

- (c) Diberi $\frac{9x + 6}{5} = 6$, cari nilai bagi x .
Given that $\frac{9x + 6}{5} = 6$, find the value of x .

Jawapan/Answer:

- (d) Diberi $5m - 86 = 7m$, cari nilai bagi m .
Given that $5m - 86 = 7m$, find the value of m .

Jawapan/Answer:

9. (a) Diberi $2(p + 1) + p - 81 = 2p$, cari nilai bagi p .
Given that $2(p + 1) + p - 81 = 2p$, find the value of p .

Jawapan/Answer:

- (b) Tentukan sama ada berikut merupakan penyelesaian bagi $8q + 12 = 68$.
Determine whether the following is the solution of $8q + 12 = 68$.
- (i) 7
(ii) 3

Jawapan/Answer:

- (c) Selesaikan persamaan berikut.
Solve the following equations.
- (i) $m + 6 = 17$
(ii) $m - 2 = 18$
(iii) $7m = 35$
(iv) $\frac{m}{2} = 1$

Jawapan/Answer:

10. (a) Umur Jason adalah empat kali umur Azman. Jika perbezaan umur mereka ialah 15, hitungkan umur mereka.
Jason is four times as old as Azman. If the difference in their ages is 15, calculate their ages.

Jawapan/Answer:

- (b) Umur Omar adalah lima kali umur Johan. Jika perbezaan umur mereka ialah 40, hitungkan umur mereka.
Omar is five times as old as Johan. If the difference in their ages is 40, calculate their ages.

Jawapan/Answer:

- (c) Selesaikan setiap persamaan linear berikut:
Solve each of the following linear equations:

(i) $\frac{q}{10} = -3$

(ii) $8(5d + 6) = 3d$

Jawapan/Answer:

- (d) Selesaikan setiap persamaan linear berikut:
Solve each of the following linear equations:

(i) $q - 5 = -2$

(ii) $\frac{3m - 1}{4} = 3m$

Jawapan/Answer:

11. (a) Selesaikan setiap persamaan linear berikut:
Solve each of the following linear equations:
- (i) $7 - x = 8$
 - (ii) $\frac{x}{2} - 5 = 11$

Jawapan/Answer:

- (b) Selesaikan setiap persamaan berikut.
Solve each of the following equations.

(i) $\frac{2m}{3} = 3$

(ii) $7(3n - 5) = n + 3$

Jawapan/Answer:

SKEMA JAWAPAN

1. (a) $(-4y - 5y - 3) + (3y + 2y - 2)$
 $= (-9y - 3) + (5y - 2)$
 $= -9y + 5y - 3 - 2$
 $= -4y - 5$

(b) $(-8k - 4) - (6k)$
 $= -8k - 6k - 4$
 $= -14k - 4$

(c) $2q - 4 + 6 - 10q$
 $= 2q - 10q - 4 + 6$
 $= (2 - 10)q + (-4 + 6)$
 $= -8q + 2$

(d) $6k - \frac{2}{5}k - \frac{4}{7}k + 6$
 $= \left(6 - \frac{2}{5} - \frac{4}{7}\right)k + 6$
 $= \left(\frac{210 - 14 - 20}{35}\right)k + 6$
 $= 5\frac{1}{35}k + 6$

2. (a) (i) $7x + 10 + 11x + 2$
 $= 7x + 11x + 10 + 2$
 $= (7 + 11)x + (10 + 2)$
 $= 18x + 12$

(ii) $-10y + 10 - 4y - 8y - 1$
 $= -10y - 4y - 8y + 10 - 1$
 $= (-10 - 4 - 8)y + (10 - 1)$
 $= -22y + 9$

(b) (i) $\frac{3m}{2} - \frac{3}{8}m$
 $= \left(\frac{3}{2} - \frac{3}{8}\right)m$
 $= \left(\frac{12 - 3}{8}\right)m$
 $= \frac{1}{8}m$

(ii) $-16n - n - 20 - 13$
 $= (-16 - 1)n + (-20 - 13)$
 $= -17n - 33$

(c) $3\frac{1}{2}x - \frac{1}{4}x$
 $= \left(3\frac{1}{2} - \frac{1}{4}\right)x$
 $= \left(\frac{14 - 1}{4}\right)x$
 $= 3\frac{1}{4}x$

(d) (i) Bukan satu ungkapan algebra
Not an algebraic expression

(ii) Satu ungkapan algebra
An algebraic expression

3. (a) (i) $7st \times (3t)^2$
 $= 7st \times 9t^2$
 $= 7 \times s \times t \times 9 \times t \times t$
 $= 7 \times 9 \times s \times t \times t \times t$
 $= 63 \times st^3$
 $= 63st^3$

(ii) $-9p^2q \div (-5pq)$
 $= \frac{-9p^2q}{-5pq}$
 $= \frac{-9 \times p \times p \times q}{-5 \times p \times q}$
 $= \frac{4}{5}p$

(b) $-8p \times 7p^2q^2 \times 10pq^2$
 $= -8 \times p \times 7 \times p \times p \times q \times q \times 10 \times p \times q$
 $\times q$
 $= -8 \times 7 \times 10 \times p \times p \times p \times p \times q \times q \times q$
 $\times q$
 $= -560 \times p^4q^4$
 $= -560p^4q^4$

(c) $\frac{(-9m^3n^5) \times 7mn^2}{-5mn^4}$
 $=$
 $\frac{-9 \times m \times m \times m \times n \times n \times n \times n \times n \times 7 \times m \times n \times n}{-5 \times m \times n \times n \times n \times n}$
 $= 12\frac{3}{5}m^3n^3$

(d) $10s^3u \times 6st \div 6stu$
 $= \frac{10 \times s \times s \times s \times u \times 6 \times s \times t}{6 \times s \times t \times u}$
 $= 10s^3$

4. (a) $\frac{(-2x^5z)(6xy)}{-6xyz}$
 $= \frac{-2 \times x \times x \times x \times x \times x \times z \times 6 \times x \times y}{-6 \times x \times y \times z}$
 $= 2x^5$

(b) $\frac{6s + 6t^2}{7}$
 $= \frac{6(4) + 6(-5)^2}{7}$
 $= \frac{24 + 150}{7}$
 $= 24\frac{6}{7}$

(c) $-2x(6y - 10)^3$
 $= -2\left(\frac{2}{3}\right)(6(3) - 10)^3$
 $= -\frac{4}{3}(18 - 10)^3$
 $= -\frac{4}{3}(8)^3$

$$= -\frac{4}{3} \times 512$$

$$= -682\frac{2}{3}$$

(d) $-10m^2 + 5n^2$
 $= -10(3)^2 + 5(-3)^2$
 $= -10(9) + 5(9)$
 $= -90 + 45$
 $= -45$

5. (a) $\frac{-7m}{8n} - (-2n)^3$
 $= \frac{-7(4)}{8(4)} - (-2(4))^3$
 $= \frac{-28}{32} - (-8)^3$
 $= -\frac{28}{32} + 512$
 $= 511\frac{1}{8}$

(b) $\frac{3x^2 + 3y^3}{2x - 2y}$
 $= \frac{3(-3)^2 + 3(1)^3}{2(-3) - 2(1)}$
 $= \frac{3(9) + 3(1)}{2(-3) - 2(1)}$
 $= \frac{27 + 3}{-6 - 2}$
 $= -3\frac{3}{4}$

(c) $-10p + 4p + 3q + 10q$
 $= -6p + 13q$

(d) (i) $4p + 9p(-3 + 3q) + 9pq$
 $= 4p + (-27p + 27pq) + 9pq$
 $= 4p - 27p + 27pq + 9pq$
 $= -23p + 36pq$

(ii) $\frac{4x^3 + 4xy}{6}$
 $= \frac{2x^3 + 2xy}{3}$

6. (a) $\frac{10m - 9(-6m - 9)}{2} - 6$
 $= \frac{10m - (-54m - 81)}{2} - 6$
 $= \frac{64m + 81}{2} - 6$
 $= \frac{64m + 81}{2} - \frac{12}{2}$
 $= \frac{64m + 69}{2}$

(b) (i) $7(3m - 7)$
 $= 7 \times 3m - 7 \times 7$
 $= 21m - 49$

(ii) $(12x^3 + 20xy + 12) \div 4$
 $= \frac{12x^3}{4} + \frac{20xy}{4} + \frac{12}{4}$
 $= 3x^3 + 5xy + 3$

(c) (i) $2x - (y + 2x)$
 $= 2x - y - 2x$
 $= -y$

(ii) $\frac{12x \times 5yz}{3xy}$
 $= 20z$

(d) (i) $\frac{-20m - 8}{4}$
 $= -5m - 2$

(ii) $\frac{4x - 1}{16x^2 - 1}$
 $= \frac{4x - 1}{(4x - 1)(4x + 1)}$
 $= \frac{1}{4x + 1}$

7. (a) (i) $\frac{3p}{4} = 3$

$$3p = 3 \times 4$$

$$p = \frac{12}{3}$$

$$p = 4$$

(ii) $9(q - 1) = 7q + 5$

$$9q - 9 = 7q + 5$$

$$9q - 7q = 5 + 9$$

$$2q = 14$$

$$q = \frac{14}{2}$$

$$q = 7$$

(b) (i) $x = 4x - 6$

$$4x - x = 6$$

$$3x = 6$$

$$x = \frac{6}{3}$$

$$x = 2$$

(ii) $5y = \frac{6 - 7y}{7}$

$$35y = 6 - 7y$$

$$35y + 7y = 6$$

$$42y = 6$$

$$y = \frac{6}{42}$$

$$y = \frac{1}{7}$$

8. (a) $3q = 84 - 3q$

$$3q + 3q = 84$$

$$6q = 84$$

$$q = \frac{84}{6}$$

$$q = 14$$

$$\begin{aligned} \text{(b)} \quad 6b - 6 &= 8b + 5 \\ 6b - 8b &= 5 + 6 \\ -2b &= 11 \\ b &= -\frac{11}{2} \end{aligned}$$

$$\begin{aligned} \text{(c)} \quad \frac{9x+6}{5} &= 6 \\ 9x+6 &= 30 \\ 9x &= 30-6 \\ 9x &= 24 \\ x &= \frac{24}{9} \\ x &= \frac{8}{3} \end{aligned}$$

$$\begin{aligned} \text{(d)} \quad 5m - 86 &= 7m \\ 5m - 7m &= 86 \\ -2m &= 86 \\ m &= -43 \end{aligned}$$

$$\begin{aligned} 9. \quad \text{(a)} \quad 2(p+1) + p - 81 &= 2p \\ 2p+2+p-81 &= 2p \\ 2p+p-2p &= 79 \\ p &= 79 \end{aligned}$$

$$\begin{aligned} \text{(b)} \quad \text{(i)} \quad \text{LHS} &= 8q + 12 \\ &= 8(7) + 12 \\ &= 56 + 12 \\ &= 68 \end{aligned}$$

$$\begin{aligned} \text{RHS} &= 68 \\ 68 &= 68 \\ \therefore \text{LHS} &= \text{RHS} \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad \text{LHS} &= 8q + 12 \\ &= 8(3) + 12 \\ &= 24 + 12 \\ &= 36 \end{aligned}$$

$$\begin{aligned} \text{RHS} &= 68 \\ 36 &\neq 68 \\ \therefore \text{LHS} &\neq \text{RHS} \end{aligned}$$

$$\begin{aligned} \text{(c)} \quad \text{(i)} \quad m + 6 &= 17 \\ m + 6 - 6 &= 17 - 6 \\ m &= 11 \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad m - 2 &= 18 \\ m - 2 + 2 &= 18 + 2 \\ m &= 20 \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad 7m &= 35 \\ \frac{7m}{7} &= \frac{35}{7} \\ m &= 5 \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad \frac{m}{2} &= 1 \\ \frac{m}{2} \times 2 &= 1 \times 2 \end{aligned}$$

$$m = 2$$

$$\begin{aligned} 10. \quad \text{(a)} \quad &\text{Biarkan umur Azman ialah } x \text{ tahun} \\ &\text{Let Azman's age be } x \text{ years old} \\ &\text{Oleh itu, umur Jason} = 4 \times x \text{ tahun} = 4x \\ &\text{Thus, Jason's age} = 4 \times x \text{ years old} = 4x \end{aligned}$$

$$\begin{aligned} 4x - x &= 15 \\ 3x &= 15 \\ x &= \frac{15}{3} \end{aligned}$$

$$\begin{aligned} x &= 5 \\ \text{Maka, umur Jason} \\ \text{Therefore, Jason's age} \\ &= 4x \\ &= 4 \times 5 \\ &= 20 \end{aligned}$$

$$\begin{aligned} \text{(b)} \quad &\text{Biarkan umur Johan ialah } x \text{ tahun} \\ &\text{Let Johan's age be } x \text{ years old} \\ &\text{Oleh itu, umur Omar} = 5 \times x \text{ tahun} = 5x \\ &\text{Thus, Omar's age} = 5 \times x \text{ years old} = 5x \end{aligned}$$

$$\begin{aligned} 5x - x &= 40 \\ 4x &= 40 \\ x &= \frac{40}{4} \end{aligned}$$

$$\begin{aligned} x &= 10 \\ \text{Maka, umur Omar} \\ \text{Therefore, Omar's age} \\ &= 5x \\ &= 5 \times 10 \\ &= 50 \end{aligned}$$

$$\begin{aligned} \text{(c)} \quad \text{(i)} \quad \frac{q}{10} &= -3 \\ q &= (-3) \times 10 \\ q &= -30 \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad 8(5d+6) &= 3d \\ 40d+48 &= 3d \\ 40d-3d &= -48 \\ 37d &= -48 \\ d &= -\frac{48}{37} \end{aligned}$$

$$\begin{aligned} \text{(d)} \quad \text{(i)} \quad q - 5 &= -2 \\ q &= -2 + 5 = 3 \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad \frac{3m-1}{4} &= 3m \\ 3m-1 &= 12m \\ 3m-12m &= 1 \\ -9m &= 1 \\ m &= -\frac{1}{9} \end{aligned}$$

$$\begin{aligned} 11. \quad \text{(a)} \quad \text{(i)} \quad 7 - x &= 8 \\ 7 - 8 &= x \\ x &= -1 \end{aligned}$$

$$(ii) \frac{x}{2} - 5 = 11$$

$$\frac{x}{2} = 16$$

$$x = 16 \times \frac{2}{1}$$

$$x = 32$$

$$(b) (i) \frac{2m}{3} = 3$$

$$2m = 3 \times 3$$

$$m = \frac{9}{2}$$

$$(ii) 7(3n - 5) = n + 3$$

$$21n - 35 = n + 3$$

$$21n - n = 3 + 35$$

$$20n = 38$$

$$n = \frac{38}{20}$$

$$n = \frac{19}{10}$$