



Subject: Grade 9 Mathematics

Topic: Equations

Total: 32 Marks

1. 2

3 marks

Explanation:

Multiply throughout by the lowest common denominator (LCD).

The LCD of 7, 3 and 5 is 105.

Then:

$$\frac{6m+2}{7} + \frac{2m+2}{3} = \frac{2m+16}{5}$$

$$\therefore 15(6m + 2) + 35(2m + 2) = 21(2m + 16) \quad [\times 105]$$

$$\therefore 90m + 30 + 70m + 70 = 42m + 336$$

$$\therefore 160m + 100 = 42m + 336$$

$$\therefore 160m - 42m = 336 - 100$$

$$\therefore 118m = 236$$

$$\therefore m = 2$$

2. - 3

3 marks

Explanation:

$$-4\left(x + \frac{1}{2}\right) + 1 = 11$$

$$\therefore -4x - 2 + 1 = 11 \quad [\text{Terms in bracket multiplied by } -4]$$

$$\therefore -4x = 11 + 2 - 1$$

$$\therefore -4x = 12$$

$$\therefore x = -3$$

3. false

2 marks

Explanation:

$$5x - 4 = 9x + 16$$

$$\therefore 5x - 9x = 16 + 4 \quad [\text{Variables and numbers on separate sides}]$$

$$\therefore -4x = 20 \quad [\text{Like terms added}]$$

$$\therefore x = -5 \quad [\text{Divided by the coefficient of } x]$$

4. D: 0

4 marks

Explanation:

$$2(x - 1)(3x + 1) = (3x + 2)(2x - 1)$$

$$\therefore 2(3x^2 - 2x - 1) = 6x^2 + x - 2$$

$$\therefore 6x^2 - 4x - 2 = 6x^2 + x - 2$$

As the terms containing x^2 will cancel, the terms containing x can be written on the left-hand side and the constant terms can be written on the right-hand side of the equation.

Then:

$$-4x - x = -2 + 2$$

$$\therefore -5x = 0$$

$$\therefore x = -\frac{0}{5}$$

$$\therefore x = 0$$

5. B: 24 and 26

4 marks

Explanation:

The first even integer is x , therefore the second even integer will be $x + 2$.

It is given that the sum of the two numbers is 50.

Therefore:

$$x + (x + 2) = 50$$

$$\therefore 2x + 2 = 50$$

$$\therefore x = 24$$

The first even integer is therefore 24.

The second even integer will then be:

$$x + 2 = 26$$

6. false

2 marks

Explanation:

Number of chocolate biscuits: c

Number of vanilla biscuits: $20 - c$

The formula will be:

$$C = 1,20c + 1,05(20 - c)$$

7. true

3 marks

Explanation:

Number of sample songs: c

Number of your own songs: Total - sample songs = $540 - c$

The formula will be:

$$C = 5c + 12(540 - c)$$

8. true

2 marks

Explanation:

Multiply throughout by the lowest common multiple (LCM) of the denominators to eliminate the fraction.

The LCM of 4 and 6 is 12.

Then:

$$\begin{aligned}\frac{3a}{4} + 5 &= \frac{5a}{6} + 2 \\ \therefore 3(3a) + 60 &= 2(5a) + 24 \quad [\times 12] \\ \therefore 9a + 60 &= 10a - 60 \\ \therefore 9a - 10a &= 24 - 60 \\ \therefore -a &= -36 \\ \therefore a &= 36\end{aligned}$$

9. 11

3 marks

Explanation:

Questions answered correctly: x

Questions answered incorrectly: $20 - x$

5 points per x correct questions: $5x$

3 points per $(20 - x)$ incorrect questions: $3(20 - x)$

Then:

$$5x - 3(20 - x) = 28$$

$$\therefore 5x - 60 + 3x = 28$$

$$\therefore 8x - 60 = 28$$

$$\therefore 8x = 28 + 60$$

$$\therefore 8x = 88$$

$$\therefore x = 11$$

Therefore, they answered 11 questions correctly.

10. 100 cents | 50 cents

6 marks

Explanation:

Cost:

Lollipop = x

Chocolate bar = $2x$

Total Cost:

$$5(2x) + 8(x) = 900$$

$$\therefore 10x + 8x = 900$$

$$\therefore 18x = 900$$

$$\therefore x = 50$$

A lollipop costs 50c.

A chocolate bar will cost $2x = 100c$.

Total: 32 Marks