



Subject: Grade 8 Mathematics

Topic: Mathematics: Term 1 - Mini-Exam

Total: 89 Marks

1. B: commutative property

4 marks

Explanation:

$$12 + 5 + 7 = 5 + 7 + 12$$

The order in which numbers are added does not matter.

This is known as the **commutative property**.

2. D: $11xy^3z^8$

4 marks

Explanation:

$$\sqrt{121x^2y^6z^{16}} \quad \text{Divide exponents by 2}$$

$$= 11xy^3z^8$$

3. 3 000 | 8 000 | 278,86

6 marks

Explanation:

To determine the amount of interest:

$$SI = p \times i \times n$$

$$= 5\,000 \times 12\% \times 5$$

$$= 3\,000$$

Leano pays R3 000 in interest. The total amount paid back is then R8 000.

If the exchange rate is R17,93 to the dollar, it means that 1 dollar will cost R17,93.

$$5\,000 \div 17,93 = 278,86$$

R5 000 is equal to 278,86 dollars.

4. false

2 marks

Explanation:

The identity element of addition is 0. If you add 0 to any number, the number stays the same or retains its "identity".

Therefore if you divide a number by 0, e.g. $7 \div 0$, the answer will be **undefined**.



5. false

2 marks

Explanation:

The term with x is $\frac{x}{2}$. This is the same as $\frac{1x}{2}$. The 1 is multiplied by x and the 2 is what x is divided by. The whole coefficient is therefore $\frac{1}{2}$.

6. C: 2 packets of candles and 3 packets of candle stands

4 marks

Explanation:

The number of candles, as more packets are bought, can be expressed as multiples of 12:
12 ; 24 ; 36 ; ...

The number of candle stands, as more packets are bought, can be expressed as multiples of 8:
8 ; 16 ; 24 ; ...

24 candles and 24 candle stands would work to have 1 candle per stand with no left overs.

24 candles is 2 packets.

24 candle stands is 3 packets.

7. B: $-8a + 4b - 11$

4 marks

Explanation:

Subtract $5a - 6b + 4$ from $-3a - 2b - 7$.

$-3a - 2b - 7 - (5a - 6b + 4)$ Distribute negative into bracket

$= -3a - 2b - 7 - 5a + 6b - 4$ Collect like terms

$= -8a + 4b - 11$

8. true

2 marks

Explanation:

Changing in the ratio 4 : 5 means that the value needs to be increased.

To change in a given ratio, multiply by the inverse of the ratio.

$$4 : 5 = \frac{4}{5}$$

The inverse is then $\frac{5}{4}$.

$$450 \times \frac{5}{4} = 562,5$$

9. -14 ; -17 ; -20 | -62

4 marks

Explanation:

To get to each successive term you need to subtract 3.

The next 3 terms are -14 ; -17 ; -20 .

Determine a pattern that works for all the terms:

$$-3(1) - 2 = -5$$

$$-3(2) - 2 = -8$$

$$-3(3) - 2 = -11$$

The general rule is to multiply the position of the term by -3, and then subtract 2.

To determine the value of the term in position 20:

$$-3(20) - 2 = -62$$

10. -11 | -3 | 17 | 25

8 marks

Explanation:

The rule is $y = 4x + 1$:

$$y = 4(-3) + 1 = -12 + 1 = -11$$

$$y = 4(-1) + 1 = -4 + 1 = -3$$

$$y = 4(4) + 17 = 16 + 1 = 17$$

$$y = 4(6) + 1 = 24 + 1 = 25$$

11. 0

3 marks

Explanation:

$$\sqrt{16+9} + (-2)^3 - (-3) \quad \text{Simplify under the square root}$$

$$= \sqrt{25} + (-2)^3 - (-3) \quad \text{Simplify square root}$$

$$= 5 + (-2)^3 - (-3) \quad \text{Simplify exponents}$$

$$= 5 + (-8) - (-3) \quad \text{Simplify}$$

$$= 5 - 8 + 3$$

$$= 0$$

12. 250 | 16

4 marks

Explanation:

Use the exchange rate R12, 50/£ :

This means R12, 50 for £1.

An item costing £ 20 will be $20 \times 12, 50$ which is R250 .

An item costing R200 will be $200 \div 12, 50$ which is £16.

13. false

2 marks

Explanation:

The law for multiplying with exponents: $x^n \times x^m = x^{n+m}$

$$\therefore 2^8 \times 2^{10} = 2^{18}$$

14. 13 200 | R13 200

3 marks

Explanation:

The ratio 3 : 2 has 5 parts.

Shaun earns $\frac{3}{5}$ of R66 000.

$$\frac{3}{5} \times 66\,000 = 39\,600$$

Nicole earns $\frac{2}{5}$ of R66 000.

$$\frac{2}{5} \times 66\,000 = 26\,400$$

$$\text{R}39\,600 - \text{R}26\,400 = \text{R}13\,200$$

Shaun earns R13 200 more than Nicole.

15. -a-2b | -1a-2b | -2b-a | -2b-1a

3 marks

Explanation:

$$-3a + 4b - 6b + 2a \quad \text{Group like terms}$$

$$= -3a + 2a + 4b - 6b \quad \text{Simplify}$$

$$= -a - 2b$$

16. false

2 marks

Explanation:

The rule for the spider diagram is:

Input $\div - 2 + 4$ will give the output.

The input is 4.

$$4 \div - 2 + 4 = -2 + 4 \\ = 2$$

The value of p is 2.

17. 48

3 marks

Explanation:

$$\begin{aligned} 50 - 3 \times (4 + 5) + 5^2 & \quad \text{Simplify brackets} \\ = 50 - 3 \times 9 + 5^2 & \quad \text{Simplify exponents} \\ = 50 - 3 \times 9 + 25 & \quad \text{Multiply} \\ = 50 - 27 + 25 & \quad \text{Simplify from left to right} \\ = 23 + 25 \\ = 48 \end{aligned}$$

18. $20 \mid x=20$

3 marks

Explanation:

$$\begin{aligned} x + 5 &= 25 \\ x + 5 - 5 &= 25 - 5 \\ x &= 20 \end{aligned}$$

19. A: Multiply the number of houses by 5 and add 1.

4 marks

Explanation:

Pattern 1 has 1 house and 6 matchsticks.

$$5(1) + 1 = 6$$

Pattern 2 has 2 houses and 11 matchsticks.

$$5(2) + 1 = 11$$

Pattern 3 has 3 houses and 16 matchsticks.

$$5(3) + 1 = 16$$

The pattern number is always the same as the number of houses. To determine the number of matchsticks for a given number of houses:

Multiply the number of houses by 5 and then add 1.

20. 90

3 marks

Explanation:

4 : 3 : 1 is 8 parts of the ratio.

Greg gets 3 of the 8 parts.

$$\frac{3}{8} \times 240 = 90$$

Greg gets 90 sweets.

21. 38 | p=38

3 marks

Explanation:

The rule to get from the input to the output is $y = 3x + 2$.

$$3(1) + 2 = 5$$

$$3(2) + 2 = 8$$

$$3(3) + 2 = 11$$

$$3(4) + 2 = 14$$

The input of 12 will give the output p .

$$3(12) + 2 = 38$$

$$\therefore p = 38$$

22. false

2 marks

Explanation:

To simplify $\frac{15p^4q^2}{-5pq^2}$, follow the order "signs, numbers, laws".

Signs: $+$ $\div$ $-$ $=$ $-$

Numbers: $15 \div 5 = 3$

Laws: When the base is the same, subtract the exponents.

$$\frac{15p^4q^2}{-5pq^2} = -3p^3$$

23. D: x^5y^4

4 marks

Explanation:

$$x^3y \times x^2y^3 = x.x.x.y \times x.x.y.y.y$$

$$= x^5y^4$$

24. $2^3 \times 3^2 \mid 2^3 \times 3^3 \times 5$

4 marks

Explanation:

$$72 = 2^3 \times 3^2$$

$$1\,080 = 2^3 \times 3^3 \times 5$$

2^3 and 3^2 is common to both numbers.

The highest common factor, as a product of prime factors, is $2^3 \times 3^2$.

For the lowest common multiple, you want one of each prime factor, and the biggest exponent for each prime factor.

The lowest common multiple, as a product of prime factors, is $2^3 \times 3^3 \times 5$.

25. $4 \mid 1 \mid -12$

6 marks

Explanation:

Consider the expression: $-4a + 5(a + b) - 6b^2 + 1$

There are 4 terms.

The constant term is 1

If $a = 1$ and $b = 2$, the value of the expression is -8.

$$\begin{aligned} -4(1) + 5(1 + 2) - 6(2)^2 + 1 &= -4 + 5(3) - 6(4) + 1 \\ &= -4 + 15 - 24 + 1 \\ &= -12 \end{aligned}$$

Total: 89 Marks