LOGARITHMS

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1) $\frac{1}{2} \log_x 64 = 3$

2) $\log_4 (x^2 + 15) = 3$

3) Simplify $\log_9 3 + \log_9 243 + 2\log_9 3$

4) Solve $\log_{\sqrt{2}} 16 = x$

5) Simplify $2\log_3 8 - 3\log_3 2$

Answers

1) $x = 2$

2) $x = 7$ or $x = -7$

3) 2

4) 8

5) $\log_3 8$

SURDS

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1) $\sqrt{20} + \sqrt{45} + \sqrt{125} - 2\sqrt{80}$

2) $(7\sqrt{2} + \sqrt{3})(7\sqrt{2} - \sqrt{3})$

3) $\dfrac{2\sqrt{2} + 3\sqrt{3}}{4\sqrt{3} - 2\sqrt{2}}$

4) Express $\dfrac{8 - 3\sqrt{6}}{2\sqrt{3} + 3\sqrt{2}}$ in the form $m\sqrt{3} + n\sqrt{2}$, where m and n are rational numbers.

5) Simplify $\dfrac{\sqrt{3}}{\sqrt{3} - 1} + \dfrac{\sqrt{3}}{\sqrt{3} + 1}$

Answers

1) $2\sqrt{5}$

2) 95

3) $\dfrac{11}{10} + \dfrac{7}{20}\sqrt{6}$

4) $\dfrac{-17}{3}\sqrt{3} + 7\sqrt{2}$

5) 3

SEQUENCES AND SERIES

1. If 8, X, Y, Z, and 20 are in arithmetic progression, Find X, Y, and Z.
2. Find the value of X, given that X+1, 2X and 2X+3 are consecutive terms of a linear sequence.
3. Insert three arithmetic mean between 19 and 35.
4. The sum of the first terms of an arithmetical progression is 255, Find the sum of the next twenty terms of the progression given that the sum of the first twenty terms of the progression is 1010.
5. Find the sum of the first twenty terms of the linear sequence 1, 5,9,13, …

ANSWERS

1. 17
2. X=4
3. 23, 27, 31
4. 2010
5. 780

COMMERCIAL ARITHMETIC

1. A motor bike costs ₦300,000. Its value depreciates by 25% in the first year, 20% in the second year and 15% in each of the following years. Find its value after 4 years.

2. Mrs. Okoro bought a car and insured it with a motor car insurance company which charges a premium equal to 5% of the value of the car. If the car was bought for ₦1.4 million and its value depreciated by 12.5% each year, what was the premium paid to the insurance company at the beginning of the third year?

3. An investor held 1000 Niger oil ₦1 shares which she bought at ₦4.75 per share. She sold half her holding at ₦5.60 per share and the rest during a crisis, when the prices had slumped. At way price per share did she sell the remaining shared if she neither gained not lost on the whole transaction?

4. A married man has no children but claims allowances of ₦22,500 for a dependent relative and ₦26,000 for insurance premiums. If his annual salary is ₦1,864,000, calculate his monthly tax payment (to the nearest ₦10).

5. The Pre-VAT cost of a refrigerator is ₦32,200. What would be the selling price if VAT is added?

a. At 5% b. At 8%

Answers

1. ₦130,050

2. ₦53,590

3. ₦3.90 per share

4. ₦31,080

5a. ₦33,810

5b. ₦34,776

APPROXIMATION AND ERRORS

1. Round off the following to given degrees of accuracy

a. 2,748,924,000 to the nearest billion

b. ₦482,677 to the nearest #10 000

c. 923,768 km^2 to the nearest 1000 km^2

2. A newspaper headline reads, 'Government rejects US$23 billion loan from IMF'. Between what two amounts does this figure lie?

3. In 2010 Nigeria's estimated reserves of foreign exchange and gold amounted to $49.67 billion and the rate of exchange was ₦150.48 to 1 US$. You are to estimate the amount of reserves in naira.

a. What would be sensible rounded values to use?

b. Use these values to find the reserves in trillions of naira (nearest trillion).

4a. What is the range of values of each of the following measurements?

i. The length of a line segment is 9cm to the nearest centimeter.

ii. The maximum temperature for a particular day in Lagos is 30.2°C to the nearest 0.1°C

b. A student draws a line and says that it is 10 cm long. When it is carefully measured, the true length is 10.2 cm. What is the percentage error in the drawing?

5. Give answers to an approximate degree of accuracy unless other stated.

I. A room is 4.6m long, 3.7m wide and 3.2m high. Calculate

* The diagonal of the longer wall

*The diagonal of the floor

II. If a sheet of cardboard is 0.8 mm thick,

*Calculate the range of values of the height of 328 sheets of the same cardboard

*Calculate the maximum and the minimum number of sheets which are in a pile 50 cm high.

Answers

1a. 3 billion

1b. ₦480,000

1c. 924,000km^2

2. $22.5 billion and $23.5billion

3a. $50 billion and ₦150

3b. ₦8 trillion

4ai. 8.5 to 9.5 cm

4aii. 30.15 to 30.25°C

4b. 2%

5Ia. 5.6m

5Ib .9m

5IIa. 250mm to 280mm

5IIb. 590 to 670