**ALPHA UNIVERSITY BORAMA**

**Assignment of math’s methods**

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1. Express the ratio 12:16 in its simplest form.
2. Divide $120 in the ratio 2:3.
3. The ratio of cats to dogs in a pet shop is 4:7. If there are 28 dogs, how many cats are there?
4. If a person earns $240 for working 8 hours, what is the rate of pay per hour?
5. Are the ratios 6:9 and 8:12 proportional?
6. If 3 shirts cost $45, how much would 5 shirts cost at the same rate?
7. If 5 pens cost $10, how much do 12 pens cost?
8. A class has 18 boys and 12 girls. What is the ratio of boys to the total number of students?
9. Find 25% of 480.
10. A jacket is sold for $150 after a 20% discount. What was the original price?
11. A salesperson earns a 5% commission on sales. If they sell goods worth $2,000, how much commission do they earn?
12. If 60% of a number is 180, what is the original number?
13. Find the simple interest on $1,200 at a rate of 5% per annum for 3 years.
14. A sum of $2,000 is invested at 10% per annum for 3 years compounded annually. Find the total amount.
15. A loan of $2,000 is given for 2 years at a rate of 6% per annum. What is the total amount to be repaid at the end of the period?

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**Answers**

1. Divide both numbers by 4,

12 / 4 = 3  
 16 / 4 = 4

Therefore, the simplest form of the ratio 12:16 is **3:4.**

1. To divide $120 in the ratio 2:3

* First find the total number of parts in the ratio, 2 + 3 = 5.
* Second find the value of one part by dividing the total amount by the total number of parts: $120 / 5 = $24.
* Third now I can find the value of each part of the ratio:
* 2 parts ratios: 2 \* 24 = $48
* 3 parts ratios : 3 \* 24 = $72

So, $120 divided in the ratio 2:3 is $48 and $72.

1. The ratio of cats are 4 and dogs are 7

**Set a proportion**: number of cats / number of dogs = **4/7**

NC= set the number of cats in pet shop

C/28 = 4/7 and then cross-multiply

7C= 4\*28 = 112

C = 112/7 =16

* So there are 16 cats in pet shop

1. To calculate the rate of person take per hour

Divide $240 / 8 hours = 30$ per Hour that is the rate paid per hour

1. Yes, the ratios 6:9 and 8:12 are proportional
2. To know the cost of the 5 shirts when 3 shirts is 45$

* First calculate the price of per shirt = $ 45/3 = $ 15
* Therefore the cost of 5 shirts = 5\* $ 15= $ 75

1. To determine the cost of the 12 pens when 5 pens price are 10$

* First calculate the price of per shirt = $ 10/5 = $ 2
* So the cost of 12 pens = 12\* $ 2 = $ 24

1. The total number of boys and girls in the class is 18 boys + 12 girls = 30

* The ratio of boys to the total number of students is 18:30
* So divide the both sides 6

18 / 6 =3

30 / 6 = 5

* So the ratio of boys to the total number students 3:5

1. 25% same as one quarter

So divide 480 by 4 = 120

Therefore 25% of 480 is 120

1. 20% discount (100%-20% = 80%) the jacket was sold 80% of the original price

* 80% divide by 100 = 0.8
* Price sold after discount = $150
* So divide $150 / 0.8 = $187.5
* the original price of the jacket before the discount was $187.5

1. Find 5% of $2,000.

* 5% /100 = 0.05.
* So, the commission earned is 0.05 \* $2,000 = $100.
* Therefore, the salesperson earns a commission of $100.

1. Let be x the original number so 60% of x equal to 180

* 60% divide by 100 = 0.6
* So x = 180 / 0.6 =300
* the original number is 300

1. the simple interest calculation

* principal (P) = 1200
* Rate ( R) = 5% = 0.05
* Time (T) = 3 years

Simple Interest = P \* R \* T

1200 \* 0.05 \* 3 = 180

So the simple interest is 180

1. compound interest for total amount

|  |  |  |  |
| --- | --- | --- | --- |
| Year | Amount at beginning of year | Compound interest | Amount of the end year |
| 1 | 2000 | 10% \*2000 =200 | 2000 +200 =2200 |
| 2 | 2200 | 10% \* 2200= 220 | 2200+220 = 2420 |
| 3 | 2420 | 10% \* 2420 =242 | 2420 + 242 = 2662 |

2000 \*1.331 = 2662 so the total amount of 3 years is $ 2662

1. the total amount to be repaid at the end of the period

|  |  |  |
| --- | --- | --- |
| year | Simple interest | Amount at the end of the year |
| 1 | $2,000 \* 0.06 =120 | $2000 + 120 =2120 |
| 2 | $2,000 \* 0.06 =120 | $2120 +120 =2240 |