**Alpha University**

**Faculty of Social work**

**Assignment**

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To simplify the ratio 12:16:

1. Find the greatest common divisor (GCD) of 12 and 16.
   * GCD of 12 and 16 is **4**.
2. Divide both terms by the GCD:
   * 12 ÷ 4 = 3
   * 16 ÷ 4 = 4

**Simplified ratio = 3:4**

**Q2** To divide $120 in the ratio 2:3:

1. Add the parts of the ratio:  
   2 + 3 = **5 parts**
2. Find the value of one part:  
   $120 ÷ 5 = **$24**
3. Multiply each part:
   * 2 parts = 2 × $24 = **$48**
   * 3 parts = 3 × $24 = **$72**

**Answer:** $120 divided in the ratio 2:3 is **$48 and $7**2

**Q3** The ratio of cats to dogs is **4:7**, and there are **28 dogs**.

1. The 7 parts in the ratio correspond to 28 dogs:  
   28 ÷ 7 = **4** (value of one part)
2. Multiply by the number of cat parts (4):  
   4 × 4 = **16 cats**

**Answer:** There are **16 cats** in the pet shop.

**Q4** To find the rate of pay per hour:

1. Divide total earnings by total hours worked:  
   $240 ÷ 8 hours = **$30 per hour**

**Answer:** The rate of pay is **$30 per hour**.

**Q5** To check if the ratios **6:9** and **8:12** are proportional:

1. Simplify both ratios:
   * 6:9 → divide both by 3 → **2:3**
   * 8:12 → divide both by 4 → **2:3**
2. Since both simplify to **2:3**, they **are proportional**.

**Answer:** Yes, the ratios 6:9 and 8:12 are **proportional**.

**Q6** If **3 shirts cost $45**, first find the cost of **1 shirt**:

* $45 ÷ 3 = **$15 per shirt**

Now multiply by 5:

* $15 × 5 = **$75**

**Answer:** 5 shirts would cost **$75** at the same rate.

**Q7** If **5 pens cost $10**, then the cost of **1 pen** is:

* $10 ÷ 5 = **$2 per pen**

Now, multiply by 12:

* $2 × 12 = **$24**

**Answer:** 12 pens cost **$24**.

**Q8** The number of boys = **18**  
The number of girls = **12**  
Total students = 18 + 12 = **30**

Ratio of boys to total students = 18:30

Now simplify the ratio:

* GCD of 18 and 30 is **6**
* 18 ÷ 6 = 3
* 30 ÷ 6 = 5

**Answer:** The simplified ratio of boys to total students is **3:5**.

**Q9**

To find **25% of 480**:

* 25% = 25 ÷ 100 = 0.25
* 0.25 × 480 = **120**

**Answer:** 25% of 480 is **120**.

**Q10** Let the original price be **x**.

A **20% discount** means the jacket is sold for **80% of the original price**.

So:

* 80% of x = $150
* 0.80 × x = 150
* x = 150 ÷ 0.80
* x = **$187.50**

**Answer:** The original price was **$187.50**.

**Q11** To calculate the **5% commission** on **$2,000**:

* 5% = 5 ÷ 100 = 0.05
* 0.05 × 2,000 = **$100**

**Answer:** The salesperson earns **$100** in commission.

**Q12** To find the original number, let the number be xxx.

We know that 60% of the number is 180, so we can write the equation:

0.60×x=1800.60 \times x = 1800.60×x=180

To solve for xxx, divide both sides of the equation by 0.60:

x=1800.60=300x = \frac{180}{0.60} = 300x=0.60180​=300

So, the original number is **300**.

**Q13** To calculate **simple interest**, use the formula:

Simple Interest (SI)=P×R×T100\text{Simple Interest (SI)} = \frac{P \times R \times T}{100}Simple Interest (SI)=100P×R×T​

Where:

* P=1200P = 1200P=1200 (principal amount),
* R=5%R = 5\%R=5% (rate per annum),
* T=3T = 3T=3 years (time).

SI=1200×5×3100=18000100=180\text{SI} = \frac{1200 \times 5 \times 3}{100} = \frac{18000}{100} = 180SI=1001200×5×3​=10018000​=180

**Answer:** The simple interest is **$180**.

**Q14**

To calculate **compound amount**, use the formula:

A=P(1+R100)TA = P \left(1 + \frac{R}{100}\right)^TA=P(1+100R​)T

Where:

* P=2000P = 2000P=2000 (principal),
* R=10%R = 10\%R=10% (rate per annum),
* T=3T = 3T=3 years (time).

A=2000(1+10100)3=2000(1.1)3A = 2000 \left(1 + \frac{10}{100}\right)^3 = 2000 \left(1.1\right)^3A=2000(1+10010​)3=2000(1.1)3 A=2000×1.331=2662A = 2000 \times 1.331 = 2662A=2000×1.331=2662

**Answer:** The total amount is **$2,662**.

**Q15** To calculate the total amount to be repaid for a loan with simple interest, we use the simple interest formula:

Simple Interest=P×R×T100\text{Simple Interest} = \frac{P \times R \times T}{100}Simple Interest=100P×R×T​

Where:

* PPP is the principal amount (loan),
* RRR is the rate of interest per annum,
* TTT is the time period in years.

Given:

* P=2000P = 2000P=2000,
* R=6%R = 6\%R=6%,
* T=2T = 2T=2 years,

Now, substitute the values into the formula:

Simple Interest=2000×6×2100=24000100=240\text{Simple Interest} = \frac{2000 \times 6 \times 2}{100} = \frac{24000}{100} = 240Simple Interest=1002000×6×2​=10024000​=240

The simple interest is **$240**.

To find the total amount to be repaid, add the interest to the principal:

Total Amount=Principal+Interest=2000+240=2240\text{Total Amount} = \text{Principal} + \text{Interest} = 2000 + 240 = 2240Total Amount=Principal+Interest=2000+240=2240

So, the total amount to be repaid at the end of the 2 years is **$2,240**.

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* P*P* is the principal amount (the initial amount),
* R*R* is the rate of interest per annum,
* T*T* is the time period in years.

Given:

* P=1200*P*=1200,
* R=5%*R*=5%,
* T=3*T*=3 years,

Now, substitute these values into the formula:

Simple Interest=1200×5×3100=18000100=180Simple Interest=1001200×5×3​=10018000​=180

So, the simple interest is **$180**.