# Year 9 Term 1 Homework

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| **Student Name**: _____ | **Grade**: _____ |
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# 10 Year 9 Term 1 Week 10 Homework

## 10.1 Chapter Review

### 10.1.1 Significant figures

A significant figure is a number that is correct within some stated degree of accuracy. The rule for significant figures are:

- All non-zero digits are significant.
- Zeros between non-zero digits are significant.
- Zeros at the end of a decimal are significant.
- Zeros before the first non-zero digit in a decimal are not significant.
- Zeros after the last non-zero digit in a whole number may or may not be significant.

**Exercise 10.1.1 Round off 76.543 correct to:**

1. *2 significant figures* _____
2. *3 significant figures* _____
3. *4 significant figures* _____

**Exercise 10.1.2 State the number of significant figures in each of the following:**

1. *8004* _____
2. *0.36* _____
3. *18.020* _____
4. *0.01201200* _____

**Exercise 10.1.3 Round off each of the following correct to 3 significant figures:**

1. *8280* _____
2. *364005* _____
3. *0.25949* _____
4. *194.62* _____

### 10.1.2 Recurring decimals

**Exercise 10.1.4 Convert each of these recurring decimals to a fraction or a mixed numeral, in simplest form:**

1. $0.\dot{2}\ddot{7}$

2. $0.41\dot{6}$

### 10.1.3 Rates

- A rate is a comparison of two unlike quantities.
- A rate is a measure of how one quantity is changing with respect to another.
- To be in simplest form, a rate must be expressed as a quantity per one unit of another quantity.

**Exercise 10.1.5 Complete the following equivalent rates:**

1. *60 m/s = _____ km/h*
2. *1.5 m/min = _____ km/day*
3. *25 mL/s = _____ L/h*
4. *1.25 t/h = _____ kg/day*

**Exercise 10.1.6 Further applications**

1. *Calculate the daily interest rate on a credit card if the annual rate is 18.5% p.a.*

2. *Convert \$734.50/quarter to an equivalent weekly rate.*

### 10.1.4 Algebra

**Exercise 10.1.7 Find the value of the following expressions if** $a = 3,\ b = -4\, and\, c = \frac{1}{2}$

1. $a^2(c+b)$
2. $a^2 + b^3 + c$
3. $\frac{1}{c} - \frac{1}{b}$

**Exercise 10.1.8 Simplifying the following expressions:**

1. $x^2 + 2x + 2x^2 + 3x + 3x^3 - x$
2. $(-ab) \times (-bc) \times 2ab$
3. $\frac{1}{4}x \times 4x^2 \times (-2x)$
4. $9xy \div 3x \times 2y$
5. $\frac{3x-x+2x}{2\times 2x}$
6. $\frac{5a\times 4b\times 2c}{10c\times b\times 8}$
7. $\frac{3}{2x} - \frac{1}{3x}$
8. $\frac{x}{3p} + \frac{3x}{4p}$
9. $\frac{2x}{3a} + \frac{y}{4a}$
10. $\frac{2}{x} \times \frac{x}{3} \times \frac{9x}{4}$

**Exercise 10.1.9 Simplify each expression by expanding the grouping symbols and then collecting like terms.**

1. $5(a+7)-3(a+6)$

2. $5(b-5)-3(b+3)$

3. $c(c-4)-5(c-4)$

**Exercise 10.1.10 Expand and simplify each of these expressions:**

1. $(2m-n)(2m+n)$

2. $(2n+m)(n+2m)$

3. $(3p+2q)(2p+3q)$

4. $(2x+3y)^2$

5. $5(x-5)^2-4(x-4)^2+3(x-3)^2$

### 10.1.5 Consumer arithmetic

**Exercise 10.1.11**

1. *Due the the economic downturn, the employees at a small financial company have their pay reduced by 8%. Calculate the new annual pay for an employee who previously earned $920 per week.*

2. *A real estate agent is paid a commission of 3% on the first $200,000 of the value of a property and 2% of the remaining value. Find the total commission on the sale of a house sold for $585,000.*

3. *Raymond normally earns $712.50 for a 38-hour work. For how many hours would he have work in a week where his total pay is $825.00, if all overtime is paid at the one and a half times rate?*

4. *Jane purchased a LCD TV with a marked price of $1500 at the mid-year sales, where everything in the store was advertised at 15% off. She was also given a further discount of 3% because she paid cash. How much did she pay for the TV?*

5. *A manufacturer sells an MP3 player to a wholesaler at cost plus 20%. The wholesaler then marks up the price by a further 25% and sells them to a retailer. The retailer then sells the MP3 player for $42.00 each, making a profit of 40%. How much would it cost to manufacture 2000 MP3 players?*

### 10.1.6 Equations, inequations and formulae

**Exercise 10.1.12 solve the following number problems:**

1. *Two-fifths of a number increased by 5 is 13. What is the number?*

2. *Nine times a number diminished by 27 is 27. Find the number.*

3. *Three tenths of a number is one more than two fifths of the number. What is the number?*

4. *Solve this equation* $\frac{x+3}{4x} = 5 + \frac{1}{x}$

5. *One number is three times more than another number. The sum of the large number and twice the smaller number is 12. Find the numbers.*

6. *The difference of two numbers is 26. The large number is 8 more than ten times the small number. What are the numbers?*

7. *A rocket plus its fuel weighs 5200 kg. After one quarter of fuel is used, the rocket and the remaining fuel weigh 4600 kg. Find the weight of the rocket?*

## 10.2 Maths challenge

**Exercise 10.2.1**

1. *If x and y are non-negative integers and* $3x + 4y = 96$*, how many pairs (x, y) are there?*
   *A. 6* *B. 8* *C. 10* *D. 9* *E. 12*

2. *Tickets to a concert cost $9 for an adult and $6 for a child. If a total of 120 adults and children attended the concert and $840 was collected, What is the difference of the number of children and the number of adults?*
   *A. 40* *B. 50* *C. 60* *D. 70* *E. 80*

3. *When the digits of a two-digit number, neither digit zero, are reversed the number formed is 36 less than the original number. the sum of the digits of the original number could be:*
   *A. 4* *B. 6* *C. 15* *D. 16* *E. 18*

## 10.3 Miscellaneous exercise

**Exercise 10.3.1 The following currency conversions show the value of 1 Australian dollar (AUD$1) in USD$, EURO and NZD$.**

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|---|---|---|
| *AUD$1 = USD$0.6402* | *AUD$1 = 0.5054 EURO* | *AUD$1 = NZD$1.2733* |

*Use these currency conversions to convert:*

1. *AUD$50 into USD$* _____
2. *AUD$25 into EURO* _____
3. *USD$1200 into NZD$* _____

**Exercise 10.3.2 Simplifying the following expressions:**

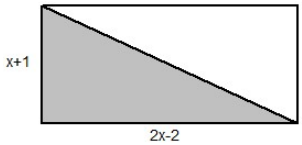
1. $\frac{5a\times 4b\times 2c}{10c\times b\times 8c}$

2. $\frac{8}{a}\times\frac{2a}{15}\div\frac{8}{3}$

3. $x(x+y)+y(x+y)$

4. $a(2a+b)+b(a+2b)$

**Exercise 10.3.3 Find an expression for the shaded area of the following figure.**



## 10.4 Practical Exam Questions

**Exercise 10.4.1**

1. *Solve for x :* $\frac{2}{x} - \frac{4}{5x} = 8$.

2. *Factorise Fully:* $3x - 6y + x^2 - 2xy$.

3. *Simplify* $\frac{9x^2-4y^2}{6x-4y}$.

4. *Solve the inequality* $\frac{2x}{3} - 1 \leq x + 2$.

5. *Solve for the x:* $\frac{2x+5}{2} - \frac{2}{3} = \frac{2x-1}{4}$.

**Exercise 10.4.2**

1. *Simplify:* $\frac{2}{x^2-1} - \frac{3}{x^2-x}$.

2. *Simplify* $\frac{x^2+8x+15}{25-5x} \div \frac{x+3}{x^2-5x}$.

3. *Factorise* $x^4 - 256$.

4. *Simplify* $\frac{(4x-y)^3-4x+y}{4x-y}$.

5. *Simplify* $\frac{x^2+x-2}{x+2} \div \frac{x^2-4x+3}{x^2-3x}$.

**Exercise 10.4.3**

1. *Find the subject of Q for the formula* $4P = 5T + 2Q^2$.

2. *Make the subject of T for the formula* $B = 2\pi\left(R + \frac{T}{2}\right)$.

3. *If* $w = 2y^3 - 1$, *what is the value of y then* $w = 13$*?*

4. *Rearrange the formula for te area of a annulus,* $A = \pi(R^2 - r^2)$, *to make R the subject.*

5. *If* $d = 6t^2$, *find a possible value of* $t$ *when* $d = 2400$.