



Year 9 Higher booklet

Week beginning May 4th 2020

Student’s name.............................................................................

Teacher:..........................................................................................

Key skills starter:

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|  |  |
| Q1)-423 + 511**= 88** | Q7) -29.4 + – 13.9 **= -43.3** |
| Q2) 479.5 $÷$ -7**= -68.5** | Q8)  16.7 x 14.6 =**= 243.82** |
| Q3) In a normal deck of cards what is the probability of picking a picture card from the deck? Put your answer in its simplest form.**= 12/52 = 3/13** | Q9) What is the term to term rule of this sequence?19, 11, 3, -5 ….**-8n + 27** |
| Q4)What is 7/12 as a percentage?**= 58.3… %** | Q10) What is the Lowest Common Multiple of 16 and 18?**= 144** |
| Q5) What is the Highest Common Factor of 124 and 252? **= 4** | Q11)Factorise…36a$b^{4}c^{5}$ – 24$a^{2}b^{2}c$**12a**$b^{2}c ( 3b^{2}c^{4} - 2a )$ |
| Q6) $5\frac{2}{5}- 3\frac{6}{7}=$ $\frac{54}{35}=1\frac{29}{35}$ | Q12) Order the following from smallest to largest 0.37, 1/3, 0.39%, 0.401, $ \frac{9}{20}$ **0.39%, 1/3, 0.37, 0.401, 9/20**  |

Solving equations:



**s = -3**

**x = -15**

**f = 22**

**g = 14**

**I = -6**

**k = 0**



**d = 27**

**y = 13**

**w = -17**

**x = 25**

Ratio and proportion:

1. Simplify 49 : 63 **7 : 9**

2. A football team played 22 games and won 10. What is the ratio of the number of wins **to the number of games played** in its simplest form? **10 : 22 5 : 11**

3. A yoga class has 18 girls and 12 boys.

a) What is the ratio of girls to boys in its simplest form? **18 : 12 3 : 2**

b) What is the ratio of girls to the class total in its simplest form? **18 : 30 3 : 5**

4. Lauren shares money between herself, Millie and Sana in the ratio of 3:4:5. Millie gets £32. How much money should Lauren and Sana have? **Lauren = £24, Sana = £40**

5. When 2: 𝑥 = 3: 6, find the value of 𝑥. **x = 4**

6. 180 people go bowling, the ratio of adults to children is 5 : 4. How many more adults go?

 **100:80 🡪 20 more adults**

7. Simplify these ratios (be careful of the units)

|  |
| --- |
|  a) 1 hour : 20 mins = **60 : 20 = 3 : 1** |
| b) 2 hours : 30 mins = **120 : 30 = 4 : 1** |
| c) 50p : £2.50 = **1 : 5** |
| d) 20cm : 15cm = **4 : 3** |

8. Simplify these ratios

|  |
| --- |
| 1. 16 : 8 : 12 = **4 : 2 : 3**
 |
| 1. 24 : 68 :96 = **12 : 34 : 48 = 6 : 17 : 24**
 |
| 1. 9 : 108 : 45 = **1 : 12 : 5**
 |

10. An ice company charged £3.40 for 4 bags of ice. If a convenience store bought 6 bags of ice, how much would it have cost them? **£5.10**

11. Haley spent 35 mins playing on her phone. That used up 1 ⁄9 of her battery. How long would she have to play on her phone to use the entire battery? **315 mins = 5 hours 15 mins**

1. In a class 18 students support Liverpool, 9 support Chelsea and 6 support Arsenal.
2. What proportion of the students support Liverpool? **18/33 = 6/11**
3. What proportion of the students support Arsenal? **6/33 = 2/11**
4. What is the ratio of Liverpool : Chelsea : Arsenal fans in the class in its simplest form**? 18 : 9 : 6**

 **6 : 3 : 2**

1. Below are the ages of 20 students in a group.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 14 | 9 | 8 | 12 | 11 | 14 | 9 | 10 | 12 | 13 |
| 8 | 7 | 12 | 11 | 10 | 10 | 8 | 15 | 9 | 14 |

1. What proportion are over the age of 9**? 13/20**
2. What proportion are 12 years old or over**? 8/20 = 2/5**
3. Here are the ingredients for a cake for **8 people**.
* 150g  [butter](https://www.bbc.co.uk/food/butter) or margarine, softened
* 120g [caster sugar](https://www.bbc.co.uk/food/caster_sugar)
* 2 medium [eggs](https://www.bbc.co.uk/food/egg)
* 140g self-raising [flour](https://www.bbc.co.uk/food/flour)
1. If you wanted enough cake for 24 people how many eggs would you need? **6 eggs**
2. If you wanted enough cake only for 6 people, how much caster sugar and butter would you need? **Caster sugar = 90g, butter = 112.5g**
3. How much self-raising flour would you need for 12 people?  **210g**
4. The ratio of brown eyes to blue eyes to green eyes in a class was 5 : 3 : 2.
5. What proportion of the class have blue eyes? **3/10**
6. What proportion of the class have brown eyes**? 5/10 = 1/2**

$17) \frac{4}{7}$ of a class are wearing the school jumper. The rest are not.

Write the ratio of those wearing the jumper to those not. **4 : 3**

1. Below is a list of the favourite colours of a group in a class

Red blue blue green purple red orange red green pink red yellow

1. What proportion of students chose red**? 4/12 = 1/4**
2. What proportion chose blue? **2/12 = 1/6**
3. In a class $\frac{1}{7}$ get a bus to school, $\frac{4}{7}$ walk to school and the rest get driven in a car.

Write a ratio of those that bus : walk : car to school. **1 : 4 : 2**

1. Here is a recipe for brownies that serve 6 people.
* 150g butter
* 160g milk chocolate
* 80g plain flour
* 40g cocoa
* 50g white chocolate
* 3 large eggs
* 250g golden syrup
1. How many eggs would I need to serve a party of 84 people? **42 eggs**
2. How much butter would I need to serve a party of 21 people. **525g**
3. List the amount of each I would need to just serve 8 people (to 1dp).

**200g butter**

**213.3g Milk chocolate**

**106.7g flour**

**53.3g cocoa**

**66.7g white chocolate**

**4 large eggs**

**333.3g golden syrup**

**Percentage Overview**

Non Calculator

1. Find 18% of £70 **£12.60**

2. Find 1.3% of 60 **0.78**

3. **Increase** £28.00 by 115% **£60.20**

4. **Decrease** £90 by 19% **£72.90**

Calculator allowed now

5. Kevin scores 49 out of 58 in an exam. What percentage did she get (to 2dp)?

 **49/58 =84.5%**

6. Luke buys a painting for £1120 and sells it for £1432. What was the **percentage increase** in its value? (2 d.p) **312/1120 = 0.2786 x 100 = 27.86%**

7. Jake buys a motorbike for £3900 and sells it for £2750.

(a) By how much has its value **decreased** as a percentage? **1150/3900**

 **29.49%**

(b) What **% of its original value** is it now worth? **70.51%**

8. Lorna buys a T shirt in the sale. The price of the T shirt **after** a 22% discount is £29.50. What was the **original** price of the T shirt? **29.5** $÷$ **0.78 = £37.82**

9. Jane bought a house for £185,000. He did some work on the house which raised its value by 8%. What is the house **now** worth? **£199, 800**

10. James has a wage rise. After a **22% increase** in her weekly salary she now earns £538.20 a week. How much did James earn **before** the increase?

 **£441.15**

11. Write down the **multiplier** used to **increase** a quantity by 9% = **1.09**

12. Write down the **multiplier** used to **increase** a quantity by 121% = **2.21**

13. Write down the **multiplier** used to **decrease** a quantity by 48% = **0.52**

14. Write down the **multiplier** to **decrease** a quantity by 29.9% = **0.701**

15. Bank A offers me 4.8% simple interest per **year** for **4 years** on my £4200 investment. Bank B offers me 0.4% compound interest per **month** for **4 years**.

Which Bank should I go with? You must show your working…

**A = £201.60 per year x 4 = 806.40 🡪 £5006.40**

**B = 4200 x** $1.004^{48}$ **= £5087.07 Therefore Bank B better option**

16. A rock decays at a rate of 3.2% per year. The initial mass of the rock is 62kg.

(a) What is the mass of the rock after 6 years? **62 x** $0.968^{6}$ **= 51kg**

(b) How long will it take for the rock to have a mass of less than 8kg?

**62 x** $0.968^{62}$ **= 8.25kg 🡪 62 x** $0.968^{63}$ **=7.99kg therefore 63 years**

17. A car goes on sale for 19.5% less than original. It now costs £10,630. What did it cost before the sale? **10630** $÷$ **0.805= £13, 204.97**