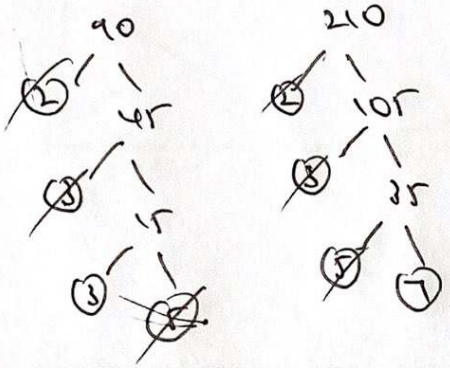
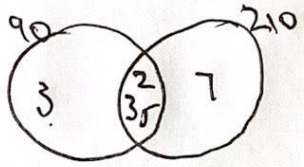
QT Quick Test 3 - Higher Calculator

1.(a) Find the highest common factor (HCF) of 90 and 210.





HCF = 2 × 3 × 5
= 30

(b) Find the lowest common multiple (LCM) of 90 and 210.

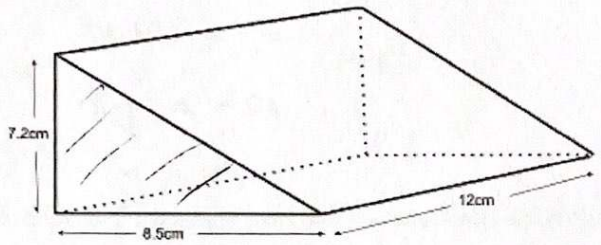
LCM = HCF × 3 × 7
= 30 × 3 × 7
= 630

2. There are only blue, black and green counters in a bag. There are 7 times as many blue counters as black counters. There are half as many green counters as black counters. Write the ratio of blue counters to black counters to green counters.

Blue : Black : Green
7 : 1 : 0.5
14 : 2 : 1

Blue : Black : Green
14 : 2 : 1

3. The diagram shows a right angled triangular prism. Calculate the volume of the prism.



Vol = Area x Depth

$= \left(\frac{b \times h}{2}\right) \times 12$

$= \left(\frac{8.5 \times 7.2}{2}\right) \times 12$

$= 367.2\text{cm}^3$

4. Nisar invests £3000 for 4 years in a savings account. He gets 2.5% per annum compound interest in the first year, then x% for the next three years. Nisar has £3215.46 at the end of 4 years. Work out the value of x.

$3000 \times 1.025^1 = 3075$

$3215.46 = 3075 \times \text{mult}^3$

$\sqrt[3]{\frac{3215.46}{3075}} = \text{mult}$.

mult = 1.0149999

mult = 1.5%.

5. Carrie runs 163.5m in 32.7 seconds. Without using a calculator, work out her average speed.

$\text{Speed} = \frac{\text{Dist}}{\text{Time}} = \frac{163.5}{32.7} = \frac{163.50}{32.7} = \frac{545}{109} = 5$

(÷3 ÷3)

6. Factorise $x^2 + 6x - 7$

$(x + 7)(x - 1)$

-7

+7 -1

7. Solve $7y + 15 = 4y - 6$

$-4y \quad -4y$

$3y + 15 = -6$

$-15 \quad -15$

$3y = -21$

$\div 3 \quad \div 3$

$y = -7$

$y = -7$

8. It takes $5\frac{1}{3}$ hours to paint a room, and 3 and a half hours for the paint to dry. How long does it take altogether?

$5\frac{1}{3} + 3\frac{1}{2}$

$8\frac{4}{6} + \frac{3}{6} = 9\frac{1}{6}$

$= 8\frac{7}{6}$

9 hours 10 mins

9. Work out an estimate for the value of $\frac{712 \times 6.14}{0.186}$

$\frac{700 \times 6}{0.2} = \frac{4200}{0.2} = \frac{42000}{2} = 21000$

10. Solve the simultaneous equations $2x + 5y = 16$ and $5x - 2y = 11$

$2x + 5y = 16 \quad \times 5$

$5x - 2y = 11 \quad \times 2$

$10x + 25y = 80$

$10x - 4y = 22 \quad -$

$29y = 58$

$y = 2$

Substitute

$2x + 5y = 16$

$2x + 5(2) = 16$

$2x + 10 = 16$

$-10 \quad -10$

$\div 2 \quad 2x = 6 \quad \div 2$

$x = 3$