

Maths Summer Assignment

These questions need to be completed before your first maths lesson at Bilborough. You must answer all questions on file paper showing your workings out. Write your full name on the top of each page and make sure that your work is presented clearly.

If you need assistance with any of these questions there is help available on our Bilborough website under the heading '**Maths - Bridging the Gap**'.

1) Cancel these fractions as far as possible:

a) $\frac{3x^2}{7x}$

b) $\frac{8x^2(x+3)}{4x}$

2) Express as a single fraction:

a) $3 + \frac{2}{x}$

b) $\frac{1}{x+1} - \frac{3}{x-2}$

3) Simplify these expressions:

a) $\frac{x+3}{x^2} \times \frac{x}{4}$

b) $\frac{x(x-3)}{3} \div \frac{x-3}{x}$

4) Make **y** the subject of the formula: $x = 5y^2$

5) Make **a** the subject of the formula: $b(a+2) = 4$

6) Make **x** the subject of the formula: $\frac{1}{x} + \frac{1}{y} = 3$

7) Make x the subject of the formula: $y = \frac{2+x}{3x}$

8) Find the distance between points $P(2,6)$ and $Q(5,14)$.

9) Factorise these expressions:

a) $20x^2 - 4x$ b) $8x^2y + 28xy^2$ c) $y^3 + 3y^2 - y$

10) Find the gradients of the lines which pass through the following points:

a) $(5, 6)$ and $(9, 15)$

b) $(-4, 8)$ and $(10, -3)$

11) Solve the following **quadratic equations**:

a) $x^2 - 7x + 10 = 0$ b) $2x^2 + 9x + 9 = 0$

c) $y = x^2 - 16$

12) Solve these simultaneous equations by the elimination method:

a) $5x + 3y = 17$ b) $7x - 3y = 48$

$4x + 10y = 25$ $x + 0.5y = 5$

13) Solve these inequalities.

a) $\frac{2x+4}{3} > \frac{x-1}{4}$

b) $2(x-1) > 3(x-2)$

14) Find the equation of the line with gradient 3 & y-intercept 5.

15) Work out these fractions calculations. Give your answers as mixed numbers.

a) $\frac{3}{4} + \frac{1}{3}$

b) $5\frac{1}{3} - \frac{3}{2}$

c) $\frac{3}{4} \times \frac{7}{8}$

d) $1\frac{3}{4} \div \frac{5}{6}$

16) Evaluate

a) $9^{\frac{1}{2}}$

b) $81^{\frac{1}{4}}$

c) 27^0

d) $b^5 \times b^6$

e) $\left(\frac{125}{8}\right)^{\frac{1}{3}}$

f) $64^{\frac{5}{6}}$

17) Simplify the following:

a) $\sqrt{72}$

b) $2\sqrt{3} + 3\sqrt{3}$

18) Work out the following:

a) $\sqrt{2} \times \sqrt{8} \times \sqrt{4}$

b) $\frac{\sqrt{30}}{\sqrt{6}}$