Lesmahagow High School

Mathematics Department

Higher October Assessment

	Topics	MIA Textbook	HH Textbook	SQA Past Papers / Revision Material
1	June: Straight Line	Page 2 – 18	Page 1 – 20	SQA – https://www.sqa.org.uk/sqa/47910.html
2	August: Quadratic Theory	Page 30 – 36 Page 115 - 124	Page 142 – 157	LHS Website – http://lhshighermaths.weebly.com/
3	September: Polynomials	Page 106 - 114	Page 125 - 136	Topic: https://www.highermathematics.co.uk/higher-maths-whole-course/
4	September: Trigonometry	Page 45 – 57 Page 152 – 166	Page 52 – 68 Page 187 - 198	Class Notes - http://www.hsn.uk.net/ (New Higher) Additional worked solutions - http://www.maths4scotland.co.uk/higher.htm

How to study Maths

Use Past Papers Wisely

- Make a list of your mistakes
- Write out solutions, don't just read them
- If you don't understand, ask
- Try a question then do it again on the 3rd day, 6th day, 10th day etc
- If you get a question wrong it stays on the mistakes list
- ask
- Try a question then do it again on the 3rd day, 6th day, 10th day etc

  If you get a question wrong it stays on the mistakes list.

Never

Just read you notes. You have to do maths to be able to do maths.

Take Advantage of the help offered

N5: Tuesday Lunch, after school Wednesday

H: After school Wednesday

Be Strategic

Sometimes do whole past papers, sometimes just focus on one topic. e.g. have a day where you just do really hard trig equations. Focus on your feedback. Use SQA marking schemes.

Do

- Weekly Quizzes
- Reattempt what you got wrong
- Do textbook exercise on the topic

Test Yourself

- Do past papers without your notes
- Time yourself (give approximately 1.5minutes per mark)
- Write down what you really know
- Redo the paper the following week
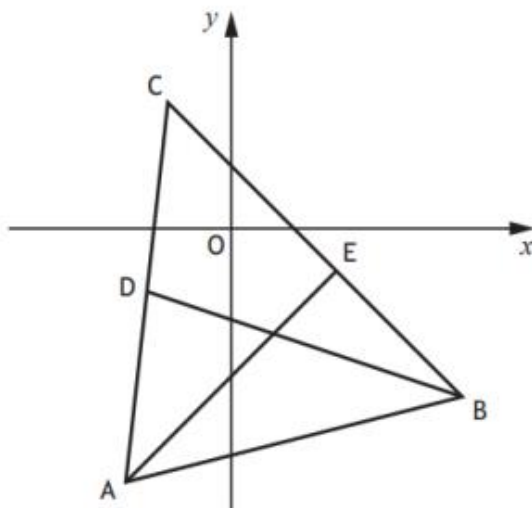- Write down if you have improved. Update your list of mistakes

Sample Questions for October Assessment

Complete these questions – use SQA marking scheme to award marks – see hyperlinks – Any issues come to supported study.

Marks In bold

1 Triangle ABC has vertices A(−5,−12), B(11,−8) and C(−3,6).

3

(a) Find the equation of the median BD.

3

(b) Find the equation of the altitude AE.

2

(c) Find the coordinates of the point of intersection of BD and AE.

https://www.highermathematics.co.uk/wp-content/uploads/2018/01/application/pdf/pdf/2019-P2-MI-Higher-Maths.pdf

2 The equation $x^2 + (k-5)x + 1 = 0$ has equal roots.

Determine the possible values of k.

https://www.highermathematics.co.uk/wp-content/uploads/2018/01/application/pdf/pdf/P1-Q2-F.pdf

3

3 (a) Express $-6x^2 + 24x - 25$ in the form $p(x+q)^2 + r$.

3

https://www.highermathematics.co.uk/wp-content/uploads/2016/03/application/pdf/pdf/2019-P2-Q7-F.pdf

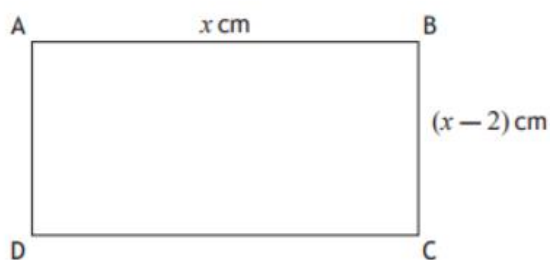4   (a)   Show that $(x+3)$ is a factor of $3x^4 + 10x^3 + x^2 - 8x - 6$.   **2**

                                                                    5

     (b)   Hence, or otherwise, factorise $3x^4 + 10x^3 + x^2 - 8x - 6$ fully.

https://www.highermathematics.co.uk/wp-content/uploads/2018/01/application/pdf/pdf/2019-P2-MI-Higher-Maths.pdf

5   ABCD is a rectangle with sides of lengths x centimetres and $(x - 2)$ centimetres, as shown.

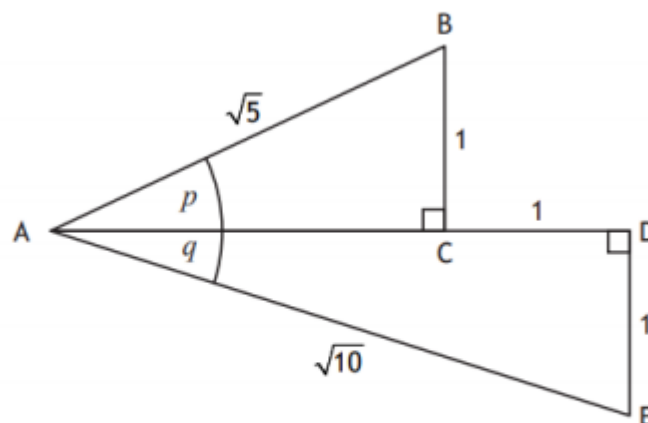   **4**

If the area of ABCD is less than $15\,\text{cm}^2$, determine the range of possible values of x.

https://www.highermathematics.co.uk/wp-content/uploads/2018/01/application/pdf/pdf/2015-MARKING-P1.pdf

6   Triangles ABC and ADE are both right angled.

Angles p and q are as shown in the diagram.

(a)   Determine the value of

   (i) $\cos p$

   (ii) $\cos q$.

(b)   Hence determine the value of $\sin(p+q)$.

1

1

3

https://www.highermathematics.co.uk/wp-content/uploads/2018/01/application/pdf/pdf/2019-P1-MI-Higher-Maths.pdf

7   (a)   Express $(\sin x - \cos x)^2$ in the form $p + q \sin rx$ where p, q and r are integers.

3

https://www.highermathematics.co.uk/wp-content/uploads/2018/01/application/pdf/pdf/2019-P1-MI-Higher-Maths.pdf

8   (a)   Show that $\dfrac{\sin 2x}{2\cos x} - \sin x \cos^2 x = \sin^3 x$, where $0 < x < \dfrac{\pi}{2}$.
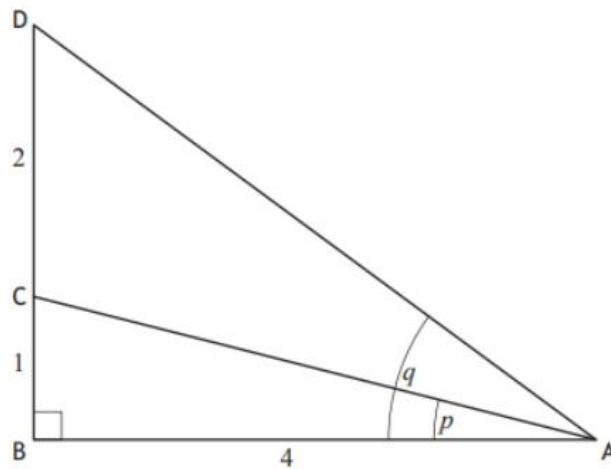
3

https://www.highermathematics.co.uk/wp-content/uploads/2018/01/application/pdf/pdf/2017-MARKING-P2.pdf

9   Triangle ABD is right-angled at B with angles BAC = p and BAD = q and lengths as shown in the diagram below.

Show that the exact value of $\cos(q - p)$ is $\dfrac{19\sqrt{17}}{85}$.

5

10   The line, L, makes an angle of 30° with the positive direction of the x-axis.

Find the equation of the line perpendicular to L, passing through $(0,-4)$.

4

200 Higher Maths
Exam Type Questions

1

Show that $(x - 1)$ is a factor of $f(x) = 2x^3 + x^2 - 8x + 5$.
Hence fully factorise $f(x)$ fully.

2

Express $x^2 + 8x + 3$ in the form $(x + p)^2 + q$ and state the coordinates of the turning point of the parabola.
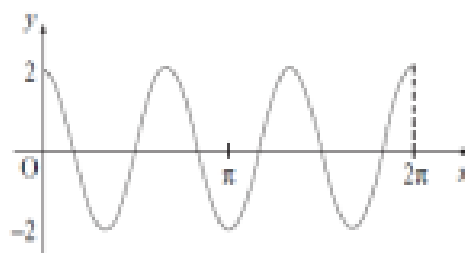
4

What is the solution of the equation $2sinx - \sqrt{3} = 0$ where $\frac{\pi}{2} \le x \le \pi$?

5

Given that $0 \le a \le \frac{\pi}{2}$ and $sina = \frac{3}{5}$, find an expression for $sin(x + a)$.

12

The diagram shows the graph with equation of the form $y = a\cos bx$ for $0 \le x \le 2\pi$. What is the equation of this graph?
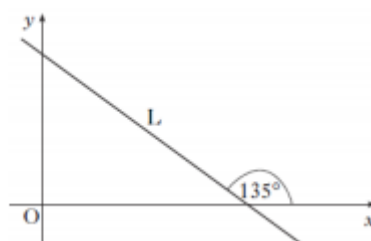

15

Write down the exact values of $\sin 60°$ and $\tan \dfrac{\pi}{6}$.

16 The diagram shows a line L; the angle between L and the positive direction of the x-axis is 135°, as shown.
What is the gradient of the line L?

35

Prove that $\dfrac{\cos^3 x}{1-\sin^2 x} = \cos x$.

42

For what values of x is $6 + x - x^2 < 0$?

55

Prove that $2\cos^2 A + 3\sin^2 A - 2 = \sin^2 A$.

81

The diagram shows the graph with equation $y = k(x-1)^2(x+t)$.
What are the values of k and t?

[END OF QUESITONS]