Pearson Edexcel

Examiners' Report

Principal Examiner Feedback

Summer 2019

Pearson Edexcel GCE AS Mathematics

In Core Maths Paper 1 (6663/01)

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2019
Publications Code 6663_01_1906_ER

General

The paper offered plenty of opportunity for candidates to demonstrate their knowledge of the Core 1 specification. There were some very good responses reported by the examiners. The questions that were the most discriminating were, Q07(c) and (d) and Q09. As in previous series, candidates frequently over-complicated the strategy required to find the area of the triangle in Q07(d), often unnecessarily calculating the lengths of sides *AB* and/or *AC*. It was also noted that, without the aid of a calculator, basic arithmetic was a problem for some, in particular the calculation of (4×23) in Q04(b) and $(16 + 16 \times 12)$ in 8(c).

Question 1

Part (a) was almost always correct although there were some instances where candidates forgot to square the "3" and so ended up with 21 rather than 63.

In part (b), the requirement to multiply numerator and denominator by $5\sqrt{3}-6\sqrt{2}$ was almost always known and gave most candidates access to the first mark. Success with the subsequent processing and associated accuracy marks was rather more varied. The most common errors were to see $6\sqrt{2}\times\sqrt{3}$ evaluated as $6\sqrt{5}$ and $\left(5\sqrt{3}+6\sqrt{2}\right)\left(5\sqrt{3}-6\sqrt{2}\right)$ evaluated as 15 – 12.

Question 2

This question proved to be a good source of marks for many candidates. It was common to see a fully correctly differentiated expression in part (a) although there was the occasional slip with one of the coefficients or powers. Part (b) was answered reasonably also although the error of omitting the minus sign with the "27" was surprisingly common and had the knock on effect of preventing access the accuracy mark in part (c).

Question 3

In this question, the majority of candidates could at least score the first 2 marks for obtaining an equation in one variable (usually x) and then, of those who realised what to do next, most opted to evaluate the discriminant of their quadratic equation, although some used the whole quadratic formula. The least successful approach was to try and complete the square, although those who reduced the coefficient of their squared term to 1 had more success. The final mark required both a reason and a conclusion and it was sometimes the case that candidates lost sight of what they were trying to show and simply concluded that there were no real roots rather than, as there were no real roots, there was no intersection. Some candidates forfeited this mark for an incorrect evaluation of 9 – 16.

Question 4

In part (a), the expression $4(8 – c)$ was almost always seen although this was frequently expanded as $32 – c$. However this subsequent incorrect expansion was not penalised at this stage.

In part (b), most candidates knew what they had to do but there were sometimes arithmetic and/or procedural errors. For example, when calculating the third term, a common error was to use $a_3 = 4a_2$ e.g. $a_3 = 4(4(8 – c))$ rather than $a_3 = 4(4(8 – c) – c)$. Some candidates also worked entirely in terms of c in this part which was fine provided they substituted for c at the end, however some left their final answer in terms of c and could gain little credit. As mentioned previously, the most common arithmetic error was in calculating (4×23). A small number of candidates thought that this part of the question involved an arithmetic progression and made an attempt to find a common difference and then applied the sum formula for an arithmetic series.

Question 5

Part (a) was almost always correct and any errors were usually arithmetic.

Part (b) produced the usual variety of responses for this type of question. Most could find the critical values by factorising or using the quadratic formula. Having found the critical values, some candidates just stopped whilst others simply wrote down $x < 7$, $x < –1/3$ but generally this part was well answered.

Part (c) was marked independently of parts (a) and (b) and this part discriminated well.

Question 6

The first two marks in this question for integrating $12x^2$ were accessible to almost all candidates. Integrating the fractional term proved to be more of a challenge. Of those who realised the need to ‘split’ the fraction, the most common error was to not deal with the “3” in the denominator correctly and the fraction was sometimes split as $12x^{-3} + 6x^{-4}$. A small minority of candidates thought that they could integrate the numerator and denominator separately and others made attempts at integration by parts but such attempts were often aborted. Of those who progressed to the point where they could attempt to find a constant of integration, basic arithmetic sometimes let them down. Of those who made significant progress towards obtaining the correct final answer, a significant number of candidates did not simply the coefficient of the x^{-2} term, leaving it as $– 4/6$ rather than $– 2/3$.

Question 7

Part (a) was well answered on the whole, with many fully correct answers seen. The most common errors occurred when attempting to obtain the equation of the straight line in the required form.

Part (b) was also well answered with the majority of the candidates obtaining the correct answer.

Parts (c) and (d) were more discriminating. It was clear that a significant number of candidates had difficulty visualising what was required in part (c) and it may have benefited some if they had drawn a diagram to help them.
Of those who made a correct start and wrote down $\sqrt{(t-3)^2+(8-11)^2}=(5-t)$, there were some who thought that $\sqrt{(t-3)^2+(8-11)^2}=(t-3)+(8-11)$ and so made no progress beyond the first mark. In part (d), responses were extremely varied and again, it seemed that many candidates had difficulty visualising the orientation of the triangle and embarked upon convoluted attempts using Pythagoras' Theorem when the more direct approach of ½ AC × 3 was all that was needed.

Question 8

This proved to be a very accessible question on arithmetic progressions. It was largely arithmetic slips that prevented many candidates from scoring full marks. Part (a) was almost always correct with only a few candidates using $a + nd$ or even $a + (n + 1)d$ rather than $a + (n - 1)d$. Part (b) was also answered well and again, only arithmetic slips prevented full marks being scored.
In part (c), many candidates realised the need to find the common difference and then the 17th term although a small minority thought they needed to find the sum of the 17 terms.

Question 9

This proved to be the most challenging question on the paper. In part (a), many candidates did not appreciate the need to differentiate and thought that the gradient of the curve was 12. This was a costly error and usually resulted in a maximum of one mark for this part. Of those who did use calculus, significant progress was often seen although slips were sometimes made when trying to get their normal equation into the required form.
Part (b) saw less success than part (a) as candidates often started with an incorrect equation such as $\frac{x^2}{12}=-\frac{4}{3}$ and that this equation had no real roots should have alerted candidates to the fact that they had not made a correct deduction from the information given in the question. Of those with a correct equation at the start it was pleasing to see that many realised that the equation had 2 solutions and went on to find both of the required points.

Question 10

In part (a)(i), the majority of candidates realised that the transformation represented a stretch in the x direction and many correct sketches were seen. A few stretched in the y direction and invariably scored no marks.
Part (a)(ii) proved to be more discriminating and in particular, the third mark for identifying the y-intercept was not scored by many candidates. This was probably due to the fact that candidates needed to use the given equation rather than the given sketch of $f(x)$ to identify this point.

Success in part (b) was varied and in a significant number of cases was not attempted.

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom