**YEAR 11 TEST 7 Revision Homework ENHANCED**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Functions** | **/20** | **Trig** | **/20** | **Quadratics** | **/20** |
| **Transform graphs** | **/10** | **Iteration** | **/10** |  |  |

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|  | **Functions** |  |
| **1.**  **F** | The diagram shows the graph of     for  −3.5 ≤ ≤ 1.5  a)  Find  b)  For which values of *k* does the equation have only one solution?    c)  Find | **(1)**  **(2)**  **(2)** |
| **2.**  **F** | **f(*x*) = g(*x*) = h(*x*) =**  Find an expression for:  a) fg(***x***) b) gf(***x***) c) hh(***x***)  d) hg(***x***) e) fgh(***x***) | **(5)** |
| **3.**  **M** | The function is such that  a)   Find    The function is such that  b)  Find  c)  Find   d)  Solve the equation  . Show clear algebraic working. | **(1)**  **(3)**  **(2)**  **(4)** |
|  | **TOTAL** | **20** |
|  | **Non-right angled trigonometry** |  |
| **1.**  **F**  Non-calc | The area of the triangle is 45 cm2    Work out the value of *x*.  Give your answer in surd form. | **(4)** |
| **2.**  **F** | a) Work out the length of the  chord.  b) Work out the area of the  shaded segment. | **(3)**  **(5)** |
| **3.**  **M**  Non-calc | Here is triangle *ABC*  Show that angle *B* = 60° | **(3)** |
| **4.**  **M** | *ACD* and *BCE* are straight lines.  Triangle *ABC* is similar to triangle *DEC*.  *AB* is parallel to *ED*.  Work out the area of triangle *ABC*. | **(5)** |
|  | **TOTAL** | **20** |
|  | **Quadratics** |  |
| **1.**  **F** | Two numbers have a difference of 15 and a product of 199.75  The larger of the two numbers is *x*.  a) Show that *x*2 – 15*x* – 199.75 = 0  b) Solve the equation *x*2 – 15*x* – 199.75 = 0 | **(2)**  **(3)** |
| **2.**  **M** | The diagram shows a trapezium.  The lengths of three of the sides of the trapezium are *x* – 5, *x* + 2 and *x* + 6. All measurements are given in centimetres.  The area of the trapezium is 36 cm2  a) Show that *x2* – *x* – 56 = 0  b) (i) Solve the equation *x2* – *x* – 56 = 0  (ii) Hence find the length of the shortest side of the trapezium. | **(4)**  **(4)** |
| **3.**  **M** | *AT* is a tangent at *T* to a circle, centre *O*.  *OT* *=* *x* cm*,* *AT* *=* (*x* + 5) cm*,* *OA* *=* (*x* + 8*)* cm*.*  a) Show that *x2* – 6*x* – 39 = 0  b) Solve the equation *x2* – 6*x* – 39 = 0 to find the radius of the circle.  Give your answer correct to 3 significant figures. | **(4)**  **(3)** |
|  | **TOTAL** | **20** |
|  | **Transforming graphs** |  |
| **1.**  **F** | The graph of *y* = sin *x* is shown.  a)     Sketch the graph of  *y* = sin (*x* + 30°)  for   0° ≤ *x* ≤ 360°      b)     Sketch the graph of  *y* = -sin*x*  for    0° ≤ *x* ≤ 360° | **(1)**  **(1)** |
| **2.**  **F** | The diagram shows a sketch of the graph   *y* = *x*2  a) Sketch a graph of *y* = (*x + 3)*2  b) Sketch a graph of *y* = *x*2 *+ 4*  c) sketch a graph of *y* = (*x − 1)*2 − 2 | **(3)** |
| **3.**  **F** | This is a sketch of the curve with equation *y* = f(*x*).  It passes through the origin *O*.  The only vertex of the curve is at *A* (2, –4)    Write down the coordinates of  the vertex of the curve with  equation  (i) *y* = f(*x* – 3),  (ii) *y* = f(*x*) – 5,  (iii) *y* = f(-*x*),  (iv) y = -f(*x*) - 2 | **(5)** |
|  | **TOTAL** | **10** |
|  | **Iteration** |  |
| **1.**  **F** | The number of bees in a beehive at the start of year *n* is *Pn*.  The number of bees in the beehive at the start of the following year is:  *Pn* + 1 = 1.05(*Pn* − 250)  At the start of 2015 there were 9500 bees in the beehive.  How many bees will there be in the beehive at the start of 2018? | **(3)** |
| **2.**  **M** | a)   Show that the equation  *x*3 + 5*x* – 4 = 0 has a solution between  *x* = 0 and *x* = 1  b)   Show that the equation  *x*3 + 5*x* – 4 = 0 can be arranged to give  c)   Starting with   *x*0 = 0,   use the iteration formula    twice,  to find an estimate for the solution of *x*3 + 5*x* – 4 = 0 | **(2)**  **(2)**  **(3)** |
|  | **TOTAL** | **10** |