**YEAR 11 TEST 7 Revision Homework ENHANCED**

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

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|  | **Functions** |  |
| **1.****F** | The diagram shows the graph of     $y=f\left(x\right)$ for −3.5 ≤ $x$ ≤ 1.5a)  Find $f\left(0\right)$b)  For which values of *k* does the equation $f\left(x\right)=k$ have only one solution?$g\left(x\right)=\frac{1}{2+x}$ c)  Find $fg\left(-3\right)$ | **(1)****(2)****(2)** |
| **2.****F** | **f(*x*) =** $4x-3$ **g(*x*) =** $3(x+1)$ **h(*x*) =** $2x+7$Find an expression for:a) fg(***x***) b) gf(***x***) c) hh(***x***) d) hg(***x***) e) fgh(***x***) | **(5)** |
| **3.****M** | The function $f$ is such that  $f\left(x\right)=\frac{2x}{3x+5}$ a)   Find  $f\left(-2\right)$The function $g$ is such that    $ g\left(x\right)=\frac{3}{x+4}$ b)  Find $g^{-1}(6)$c)  Find  $fg\left(-5\right)$d)  Solve the equation  $f\left(x\right)=g(x)$. 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 cm2Work 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 199.75The larger of the two numbers is *x*.a) Show that *x*2 – 15*x* – 199.75 = 0b) 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 cm2a) Show that *x2* – *x* – 56 = 0b) (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 = 0b) 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*2a) Sketch a graph of *y* = (*x + 3)*2b) 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 ofthe vertex of the curve withequation(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* = 1b)   Show that the equation  *x*3 + 5*x* – 4 = 0 can be arranged to give  $x=\frac{4}{x^{2}+5}$  c)   Starting with   *x*0 = 0,   use the iteration formula  $x\_{n+1}=\frac{4}{x\_{n}^{2}+5}$  twice,  to find an estimate for the solution of *x*3 + 5*x* – 4 = 0 | **(2)****(2)****(3)** |
|  | **TOTAL** | **10** |