Higher

MASTERS

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| Q | Question | Answer |
| 1 | Use the **iteration formula** $x\_{n+1}= \sqrt{9+4x\_{n}}$ to find $x\_{4}$ to 2 decimal places. Start with $x\_{0}=2.$ | X0=2X1=4.1231..X2=5.0490..X3=5.4033..X4=5.53 (2dp) |
| 2 | Using f(x) = 2x+3, g(x) = x2 and h(x)=10-3x work out the **composite function**1. fg(x)
2. Calculate hf(2)
 | i)fg(x)=2x2+3ii)hf(2)=10-3(2(2)+3)=-11 |
| 3 | What is the nth term of the following **sequence**4, 7, 12, 19, 28 | n2+3 |
| 4 | Expand and simplify the **polynomial** (t-5)3 | t3-15t2+75t-125 |
| 5 | A group of 80 people were asked if they liked different fruit. 38 said they liked apples, 42 like bananas, and 20 like cherries. 6 liked all 3 fruits. 20 people like apples and bananas, 10 of the people who liked cherries also liked bananas. 6 people like cherries and apples only.Draw a **Venn Diagram** showing this information |  |
| 6 | Here are the first and third term of a **Fibonnaci**-type sequence a, , a – 3, , .Each term is the sum of the previous 2 terms. Work out the fifth term | 2nd term = -34th term = a-65th term = 2a-9 |
| 7 | Calculate the distance travelled given in the **speed-time graph**. | Distance=area under the lineRectangle=18x5=90Triangle=0.5x12x5=30Total distance=120m |
| 8 | James invests £2000 in a bank account with a **compound interest** rate of 1.3%.Write a calculation that would give you the amount he has after 5 years. | 2,000x(1.013)5 |
| 9 | The equation of a circle is x2+y2= $\frac{1}{16}$What is the length of it’s radius? | Radius = 1/4 |
| 10 | Which of these is not the sine of an angle 0.5, -1, 0, 1.5 | 1.5 |
| Total out of  |  |

MASTERS

 Higher

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| Q | Question | Answer |
| 1 | Use the **iteration formula** $x\_{n+1}= \sqrt[3]{x\_{n}+19}$ to find $x\_{4}$ to 2 decimal places. Start with $x\_{0}=0.$ | X0=0X1=2.6684..X2=2.7878..X3=2.7930..X4=2.79 (2dp) |
| 2 | Using f(x) = 2x+3, g(x) = x2 and h(x)=10-3x work out the **composite function**1. hh(x)
2. Calculate fg(5)
 | i)hh(x)=9x-20ii)fg(5)=2(5)2+3=53 |
| 3 | What is the nth term of the following **sequence**3, 8, 15, 24, 35 | n2+2n |
| 4 | Expand and simplify the **polynomial** (x-5)(x2+2x-3) | x3-3x2-13x+15 |
| 5 | 70 students eat only an apple or only a banana.$\frac{4}{5}$ of these 70 students eat only apples.The number of students that eat apples is three times the number that eat bananas.Complete the **Venn Diagram**  |  A B |
| 6 | Here are the first and third term of a **Fibonnaci**-type sequence 7, , a - b, , .Each term is the sum of the previous 2 terms. Work out the fifth term | 2nd term = a-b-74th term = 2a-2b-75th term = 3a-3b-7 |
| 7 |  | Distance=area under the lineRectangle=20x5=100Triangle=0.5x40x5=100Total distance=200km |
| 8 | James buys a new car for £15,000 with a **compound decay** rate of 17%.Write a calculation that would give you the value of the car after 7 years. | 15,000x(0.83)7 |
| 9 | The equation of a circle is x2+y2=25What is the length of it’s radius? | Radius = 5 |
| 10 | Use inequality signs to show the range of possible values of this truncated measurement: 0.8m (1sf)  | 0.8m 0.9m |
| Total out of  |  |

MASTERS

 Higher

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| Q | Question | Answer |
| 1 | Use the **iteration formula** $x\_{n+1}= \sqrt{5x\_{n}+12}$ to find $x\_{4}$ to 2 decimal places. Start with $x\_{0}=3.$ | X0=3X1=5.1961..X2=6.1628..X3=6.5432..X4=6.69 (2dp) |
| 2 | Using f(x) = 2x+3, g(x) = x2 and h(x)=10-3x work out the **composite function**1. gf(x)
2. Calculate ff(2)
 | i)gf(x)=(2x+3)2=4x2+12x+9ii)ff(2)=2(2(2)+3)+3=17 |
| 3 | What is the nth term of the following **sequence**-1, 2, 9, 20, 35 | 2n2-3n |
| 4 | Expand and simplify the **polynomial** (t+2)3 | t3+6t2+12t+8 |
| 5 | Use **set notation** to describe: | $$P(A∩B )$$ |
| 6 | Here are the second and third term of a **Fibonnaci**-type sequence ...... , 2a+b , 3aEach term is the sum of the previous 2 terms. Work out the first term | 1st term = a-b |
| 7 | Calculate the acceleration in the first 5 seconds in the **speed-time graph**. | Acceleration = gradient(30-18)÷5=12/5mps-2 |
| 8 | James invests £3000 in a bank account with a **compound interest** rate of 1.12%.Write a calculation that would give you the amount he has after 3 years. | 3,000x(1.0112)3 |
| 9 | The equation of a circle is x2+y2= $\frac{4}{49}$What is the length of it’s radius? | Radius = 2/7 |
| 10 | Which of these is not the cosine of an angle 0.5, -1, 0, 1.5 | 1.5 |
| Total out of  |  |

MASTERS

 Higher

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| Q | Question | Answer |
| 1 | Use the **iteration formula** $x\_{n+1}= \sqrt[3]{2x\_{n}+7}$ to find $x\_{4}$ to 2 decimal places. Start with $x\_{0}=1.$ | X0=1X1=2.0800..X2=2.2347..X3=2.255..X4=2.26 (2dp) |
| 2 | Using f(x) = 2x+3, g(x) = x2 and h(x)=10-3x work out the **composite function**1. gg(x)
2. Calculate hg(1)
 | i)gg(x)=x4ii)hg(1)=10-3(1)2=7 |
| 3 | What is the nth term of the following **sequence**4, 15, 32, 55, 84 | 3n2+2n-1 |
| 4 | Expand and simplify the **polynomial** (x+5)(x2-3x-5) | x3+2x2-20x-25 |
| 5 | Use **set notation** to describe: | $$P(A∩B)$$ |
| 6 | Here are the first and third term of a **Fibonnaci**-type sequence a, , a2 +a+2, , .Each term is the sum of the previous 2 terms. Work out the fifth term | 2nd term = a2+24th term = 2a2+a+45th term = 3a2+2a+6 |
| 7 | Calculate the acceleration made in the first 5 hours | Acceleration = gradient(60-20)÷5=8kmph-2 |
| 8 | James buys a new car for £22,000 with a **compound decay** rate of 15.5%.Write a calculation that would give you the value of the car after 5 years. | 22,000x(0.845)5 |
| 9 | The equation of a circle is x2+y2=144What is the length of it’s radius? | Radius = 12 |
| 10 | Use inequality signs to show the range of possible values of this truncated measurement: 0.47g (2dp)  | 0.47g 0.48g |
| Total out of  |  |

MASTERS

 Higher

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| Q | Question | Answer |
| 1 | Use the **iteration formula** $x\_{n+1}= \sqrt{13+8x\_{n}}$ to find $x\_{4}$ to 2 decimal places. Start with $x\_{0}=5.$ | X0=5X1=7.2801..X2=8.4404..X3=8.9734..X4=9.21 (2dp) |
| 2 | Using f(x) = 2x+3, g(x) = x2 and h(x)=10-3x work out the **composite function**1. fh(x)
2. Calculate hf(5)
 | i)fh(x)=2(10-3x)+3=23-6xii)hf(5)=10-3(2(5)+3)=-29 |
| 3 | What is the nth term of the following **sequence**-1, 0, 5, 14, 27 | 2n2-5n+2 |
| 4 | Expand and simplify the **polynomial** (t+3)(t-5)2 | t3-7t2-5t+75 |
| 5 | Fill in the **Venn diagram** from the probability tree |  |
| 6 | Here are the second and third term of a **Fibonnaci**-type sequence …… , a3+a2-2 , a3+2a2+a – 5Each term is the sum of the previous 2 terms. Work out the first term | 1st term = a2+a-3 |
| 7 | Calculate the distance travelled in the first 20 seconds given in the **speed-time graph**. | Distance=area under the lineRectangle=9x16=144Triangle=9x4x0.5=18Total distance=162m |
| 8 | James invests £2500 in a bank account with a **compound interest** rate of 10.25%.Write a calculation that would give you the amount he has after 6 years. | 2,500x(1.1025)6 |
| 9 | The equation of a circle is x2+y2= $\frac{121}{64}$What is the length of it’s radius? | Radius = 11/8 |
| 10 | Use inequality signs to show the range of possible values of this truncated measurement: 0.003mm (1sf)  | 0.003mm 0.004mm |
| Total out of  |  |

MASTERS

 Higher

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| Q | Question | Answer |
| 1 | Use the **iteration formula** $x\_{n+1}= \sqrt[3]{2x\_{n}+9}$ to find $x\_{4}$ to 2 decimal places. Start with $x\_{0}=0.$ | X0=0X1=2.0800..X2=2.3609..X3=2.3940..X4=2.40 (2dp) |
| 2 | Using f(x) = 3x+4, g(x) = x2 and h(x)=$\frac{1}{x}$ work out the **composite function**1. hg(x)
2. Calculate fg(5)
 | i)hg(x)=$\frac{1}{x^{2}}$ii)fg(5)=3(5)2+4=79 |
| 3 | What is the nth term of the following **sequence**-4, -4, -2, 2, 8 | n2-3n-2 |
| 4 | Expand and simplify the **polynomial** (2x-5)(x2-2x-3) | 2x3-9x2+4x+15 |
| 5 | 70 students eat only an apple or only a banana.$\frac{6}{7}$ of these 70 students eat only apples.The ratio for the number of students that eat apples to the number that eat bananas is 3:2.Complete the **Venn Diagram**  |  A B |
| 6 | Here are the second and third term of a **Fibonnaci**-type sequence …… , x+xy+y , y-2Each term is the sum of the previous 2 terms. Work out the first term | 1st term = -x-xy-2 |
| 7 | Given that the **speed-time graph** shows the motion of a sprinter completing a 200m race, calculate u. | Distance at 20s = 162mArea of trapezium between20s and 25s = 38(U+9)/2 x 5 = 38U = 6.2 |
| 8 | James buys a new car for £7,779 with a **compound decay** rate of 9.8%.Write a calculation that would give you the value of the car after 2 years. | 7,779x(0.902)2 |
| 9 | The equation of a circle is x2+y2=125What is the length of it’s radius?Simplify your answer | Radius = $\sqrt{125}$ = $5\sqrt{5}$ |
| 10 | Use inequality signs to show the range of possible values of this truncated measurement: 0.739ml (3dp)  | 0.739ml 0.740ml |
| Total out of  |  |

MASTERS

 Higher

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| Q | Question | Answer |
| 1 | Use the **iteration formula** $x\_{n+1}= \sqrt{2+3x\_{n}}$ to find $x\_{3}$ to 2 decimal places. Start with $x\_{0}=12.$ | X0=12X1=6.1644..X2=4.5269..X3=3.95 (2dp) |
| 2 | Using f(x) = 3x+4, g(x) = x2 and h(x)=$\frac{1}{x}$ work out the **composite function**1. fg(x)
2. Calculate hf(2)
 | i)fg(x)=3x2+4ii)hf(2)=1/(3(2)+4)=1/10 |
| 3 | What is the nth term of the following **sequence**-4, 8, 26, 50, 80 | 3n2+3n-10 |
| 4 | Expand and simplify the **polynomial** (2t-5)3 | 8t3-60t2+150t-125 |
| 5 | A vet surveys 100 of her clients. She finds that:25 own dogs,15 own cats and dogs, 11 own dogs and tropical fish,53 own cats, 10 own cats and tropical fish,7 own dogs, cats and tropical fish, 40 own tropical fish.Draw a **Venn Diagram** showing this information |  D C F |
| 6 | Here are the second and third term of a **Fibonnaci**-type sequence …… , (x-2)2, 2x2-4x+1Each term is the sum of the previous 2 terms. Work out the first term | 1st term = x2-3 |
| 7 | Given that the **speed-time graph**. Shows the motion of a sprinter running a 200m race. Calculate his maximum speed to 2dp. | Area of trapezium = 200(20.32+15.32)/2 x speed = 200Speed = 11.22mps |
| 8 | James invests £10,000 in a bank account with a **compound interest** rate of 3.33%.Write a calculation that would give you the amount he has after 8 years. | 10,000x(1.0333)8 |
| 9 | The equation of a circle is x2+y2= 12What is the length of it’s radius?Simplify your answer | Radius = $\sqrt{12}$ = $2\sqrt{3}$ |
| 10 | Use inequality signs to show the range of possible values of this truncated measurement: 8.7g (2sf)  | 8.7g 8.8g |
| Total out of  |  |