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| *School Name*  *Mathematics Test 2017* | | | |
| Year 10 | | *Non-Right Triangle Trigonometry* | Calculator Allowed |
| **Skills and Knowledge Assessed:**   * Apply Pythagoras’ theorem and trigonometry to solving three - dimensional problems in right- angled triangles (ACMMG276) * Use the unit circle to define trigonometric functions, and graph them with and without the use of digital technologies (ACMMG274) * Solve simple trigonometric equations (ACMMG275) * Establish the sine, cosine and area rules for any triangle and solve related problems (ACMMG273) | | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Section 1** Short Answer Section | | | |
| Write all working and answers in the spaces provided on this test paper. | | | |
|  | Complete the statement of the cosine rule below for ∆*PQR?*    ……………………………………………....  ………………………… | | |
|  | Write a statement of the sine rule which could be used to  find the distance *GH* ?  (You do not need to complete the calculation and find *GH*.)  ………………………………………………  ……………………………………………....  ………………………………………………  ………………………………………………. | | |
|  | Find the size of , correct to the nearest degree.  ………………………………………………  ……………………………………………....  ………………………………………………  ………………………………………………. | | |
|  | Use the cosine rule to find the value of *w*, correct to 2 significant figures.  ………………………………………………  ………………………………………………  ……………………………………………....  ………………………………………………  ………………………………………………. | | |
|  | Find the area of the triangle shown.  ………………………………………………  ……………………………………………....  ………………………………………………  ………………………………………………. | | |
|  | Solve  ………………………………………………  ……………………………………………....  ………………………………………………  ………………………………………………. | | |
|  | Calculate the value of  correct to the nearest degree.    ………………………………………………  ……………………………………………....  ………………………………………………  ………………………………………………. | | |
|  | Find the value ofto the nearest millimetre.  ………………………………………………  ……………………………………………....  ………………………………………………  ………………………………………………. | | |
|  | Find the area of this triangle, correct to the nearest square centimetre.    ………………………………………………  ……………………………………………....  ………………………………………………  ………………………………………………. | | |
|  | In the rectangular prism shown, *TU* = 150 cm *UX* = 80 cm and *UY* = 120 cm.  Find the size of  ………………………………………………  ……………………………………………....  ………………………………………………  ………………………………………………. | | |
|  | A lighthouse *N* is on top of a cliff.  The direct distance from ship *S* to *N* is 4100 m and from ship *T* to *N* is 3600 m.  The two ships are in a straight line to the lighthouse and are 900 m apart.  What is the angle of elevation of the lighthouse from ship *T*?  ………………………………………………  ……………………………………………....  ………………………………………………  ………………………………………………. | | |
|  | Complete the table below and use it to draw a sketch of  for   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | *x* | 0o | 30o | 45o | 60o | 90o | 120o | 135o | 150o | 180o | | tan *x* |  |  |  |  |  |  |  |  |  | | | |
|  | Ship *R* is 200 km on a bearing of 048o from Port *P*.  Ship *Q* is 185 km from Port *P*.  Ships *Q* and *R* are 325 km apart.  Calculate the bearing of *Q* from *P*.  ………………………………………………  ……………………………………………....  ………………………………………………  ………………………………………………. | | |
|  | Given that  Find the values of *x* if .  ……………………………………………………………………………………………....  ………………………………………………………………………………………………  .……………………………………………………………………………………………....  ………………………………………………………………………………………………. | | |
|  | A tower *VX* has an angle of elevation of 20o when viewed from *U* which is 150 m away from *X* on level ground.  It has an angle of elevation of 28o when viewed from *W* which is in the same plane as *U* and *X.*    How far is *W* from *X*?  …………………………………………....  ………………………………………………  ………………………………………………  ……………………………………………....  ………………………………………………  ………………………………………………. | | |

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| Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Section 2** Multiple Choice Section | | | |
| Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section. | | | |
|  | Which of the following could **not** be used to find the size of  in  A.  B.  C.  D. | | |
|  | Which expression could be used to find the length of the diagonal AG in the rectangular prism shown.  A.  B.  C.  D. | | |
|  | Use the sine rule to find the size of  correct to the nearest degree.    A. 21o  B. 40o  C. 44o  D. 46o | | |
|  | Use the cosine rule to find the value of *x*, correct to the nearest metre.    A. *x* = 119  B. *x* = 180  C. *x* = 410  D. *x* = 445 | | |
|  | Which equation would best describe the graph shown below?    A.  B.  C.  D. | | |
|  | What is the value of  A.  B.  C.  D. | | |
|  | Find the length of the side *MN*.  A. 3.7 cm  B. 12.9 cm  C. 13.6 cm  D. 18.8 cm | | |
|  | Find the area of  Answer to the nearest cm2.  A. 985 cm2  B. 995 cm2  C. 1000 cm2  D. 1970 cm2 | | |
|  | Find the value of  between 0o and 90o such that  Answer to the nearest degree.  A.  B.  C.  D. | | |
|  | Three points *A*, *B* and *C* are shown on a map,  along with the compass bearings of two of the points  What is the size of  A. 63o  B. 83o  C. 87o  D. 93o | | |
|  | In  Calculate the size of  A. 45o  B. 52o  C. 62o  D. 65o | | |
|  | Two hikers leave the same camp ground at the same time.  Michael hikes 12.5 km on a bearing 220o.  Ben hikes 15.5 km on a bearing 295o.  How far apart are the two hikers?  A. 4.0 km  B. 8.3 km  C. 17.2 km  D. 18.6 km | | |
|  | If  which statement describes all the possible values of   A.  only.  B. .  C.  D.  only. | | |
|  | The diagram shows two right angled triangles which share a common side *BC* in 3 dimensions.  By first finding the length of *BC*, calculate the length of *BD*.    A. 11.7 cm  B. 22.1 cm  C. 28.2 cm  D. 29.4 cm | | |
|  | In the  is a point on *PR* such that    Find the length of *PR,* correct to the nearest mm.  A. 6.8 cm  B. 32.4 cm  C. 38.7 cm  D. 46.7 cm | | |

*School Name*

*Mathematics Test 2017*

*Multiple Choice Answer Sheet*

*Non-Right Triangle Trigonometry*

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Completely fill the response oval representing the most correct answer.

1. A B C D

2. A B C D

3. A B C D

4. A B C D

5. A B C D

6. A B C D

7. A B C D

8. A B C D

9. A B C D

10. A B C D

11. A B C D

12. A B C D

13. A B C D

14. A B C D

15. A B C D

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| *School Name*  *Mathematics Test 2017* | | |
| Year 10 | *Non-Right Triangle Trigonometry* | Non Calculator Section |

ANSWERS

| Question | Working and Answer |
| --- | --- |
|  |  |
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|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  | Need two sides and an included angle so use 100o angle. |
|  |  |
|  | Need to find |
|  | |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | *x* | 0o | 30o | 45o | 60o | 90o | 120o | 135o | 150o | 180o | | tan *x* | 0 | 0.577 | 1.00 | 1.732 | Undef | -1.732 | -1.00 | -0.577 | 0 | |
|  |  |
|  | Recalling the sketch of    The only value is ***x* = 0** |
|  |  |

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| *School Name*  *Mathematics Test 2017* | | |
| Year 10 | *Non-Right Triangle Trigonometry* | Calculator Allowed  Multiple Choice  Section |

ANSWERS

|  |  |  |
| --- | --- | --- |
| Question | Working | M C Answer |
|  | has the *w* and *x* terms in the wrong positions. | **D** |
|  |  | **B** |
|  |  | **C** |
|  |  | **D** |
|  | Curve is a periodic wave, and has y =1 when x = 0, so since , the graph could be | **A** |
|  |  | **B** |
|  |  | **C** |
|  |  | **A** |
|  |  | **C** |
|  | Join *BD* so *D* is south of *B*. | **D** |
|  |  | **B** |
|  |  | **C** |
|  |  | **A** |
|  |  | **D** |
|  |  | **D** |

*School Name*

*Mathematics 2017*

*Multiple Choice Answer Sheet*

*Non-Right Triangle Trigonometry*

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Completely fill the response oval representing the most correct answer.

1. A B C D

2. A B C D

3. A B C D

4. A B C D

5. A B C D

6. A B C D

7. A B C D

8. A B C D

9. A B C D

10. A B C D

11. A B C D

12. A B C D

13. A B C D

14. A B C D

15. A B C D