Maths Australia

PLACEMENT TEST

FOR MATH-U-SEE ADVANCED LEVELS
PRE-ALGEBRA, ALGEBRA 1, GEOMETRY & ALGEBRA 2

PLACEMENT TEST INSTRUCTIONS

Use these placement tests to determine your students

a) **current level of maths mastery and**

b) **where there are any gaps in their learning**

Every student is unique. The placement tests are understanding based tests, which means they will determine the student's understanding, irrespective of their age, or current grade level.

1. If your student has completed all of the Foundation Level Placement Tests from Alpha to Zeta, commence at the Pre-Algebra Level Placement Test below. If your student is finger counting, or has not completed the Foundation Level Placement Tests, please see instructions in the Foundation Level Placement Tests.

2. Progress through each Placement Test until the student begins to struggle or shows signs of not understanding the questions.

3. When the student scores less than 90% on a test, stop right there. This marks their current level of maths mastery.

4. Once you have finished the placement tests you can feel confident you have identified your students unique level of maths mastery.

BEGINNING AT THE PRE-ALGEBRA PLACEMENT TEST, HAVE YOUR STUDENT PROGRESS THROUGH EACH TEST IN THE ORDER BELOW.

Pre-Algebra Placement Test   Result: _____

Algebra 1 Placement Test   Result: _____

Geometry Placement Test   Result: _____

Algebra 2 Placement Test   Result: _____

Pre-Algebra Placement Test

To receive the full benefit of this test, watch the student to ensure he has mastered the concepts presented in Pre-Algebra.

If he demonstrates proficiency, he is ready to move on to Algebra 1.

If he struggles with the material on this exam, he should begin in Pre-Algebra.

1) $(-8) + (-25) =$ 2) $(-7) \times (-15) =$ 3) $(11) - (-6) =$ 4) $(-45) \div (9) =$

Simplify.

5) -1^3 6) $-(5)^2$ 7) $(-8)^2$ 8) $(-\frac{2}{3})^2$

Write in exponential notation.

9) 95.214

Write in standard notation.

10) $1 \times 10^3 + 8 \times 10^2 + 2 \times 10^1 + 5 \times 10^0 + 6 \times \dfrac{1}{10^1}$

Simplify each expression.

11) $\sqrt{100} =$ 12) $\sqrt{Y^2} =$

Simplify and solve for the unknown. Use order of operations as needed. Check your work.

13) $8 \cdot 2 + 5^2 - Y = 2(Y + 1) + 6$ 14) Check

15) $8M - 4M - 6 - 3 + 5M = 8^2 - 1$ 16) Check

17) $(-3)^2 \div 9 + 6 = D$ 18) Check

Solve for the unknown.

19) $\dfrac{1}{8} = \dfrac{7}{Y}$ 20) $\dfrac{11}{12} = \dfrac{A}{48}$

21. Allen has a debt of $500. He owes equal amounts to ten different people. Express his debt to one person as a negative number.

22. If Silas added 5 years to his age, he would be 39. How old is Silas now? Write as an equation and solve.

23. Three times a number, plus eight, equals two times the number, plus ten. Write an equation and find the number.

24. A triangle has sides of 3 centimetres, 4 centimetres and 5 centimetres. Is it a right triangle?

25. One out of eight students has red hair. If there are twenty-four students, how many have red hair?

26. A room is 15 metres long, 13 metres wide, and 10 metres high. The walls, ceiling, and floor are all to be painted the same color. How many square metres are to be painted?

Algebra 1 Placement Test

To receive the full benefit of this test, watch the student to ensure he has mastered the concepts presented in Pre-Algebra.

If he demonstrates proficiency, he is ready to move on to Algebra 1.

If he struggles with the material on this exam, he should begin in Pre-Algebra.

I. Express in simplest terms *(6 points each)*

1) $\left(\dfrac{1}{2}\right)^2 + (ab)^0 \quad 3^2$

2) $\sqrt{16X^2}$

3) $\left(3^X\right)^Y \left(3^X\right)$

4) $|\,6 - 8\,|$

5) $\sqrt{X^2 + 4X + 4}$

6) $\left(81^{1/2}\right)^3$

7) $3X^3 X^{\,1} + \dfrac{20X^2}{X^{\,4}} + \dfrac{5X}{X^{\,1}}$

II. Factor *(10 points each)*

1) $3X^2 \quad 27$

2) $5X^2 \quad 9X \quad 2$

3) $X^3 + 5X^2 + 6X$

4) $14Y^2 \quad 7Y \quad 42$

III. Solve for X.   *(8 points)*

1) $1,000,000 = (10^3)^X$

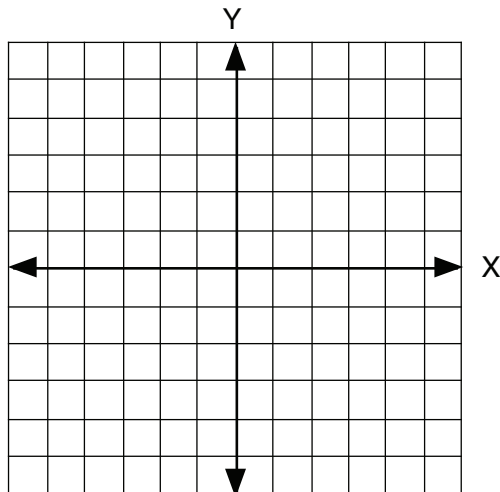IV. Solve for X. Factor first if necessary. *(10 points each)*

1) $3X^2 - 6X = 0$

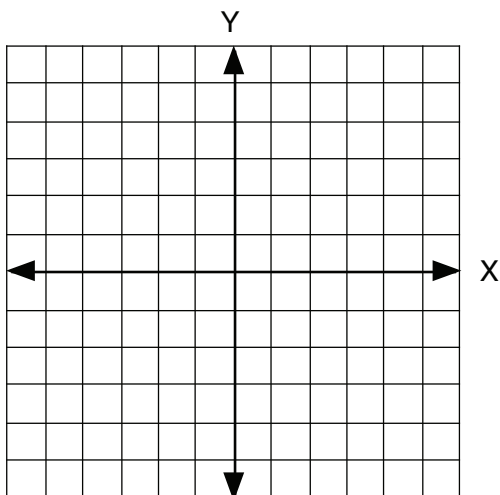2) $\dfrac{1}{5} X - \dfrac{1}{2} = \dfrac{2}{3}$

3) $\dfrac{2}{X} + \dfrac{14 - X}{4} = 4$ $(X \neq 0)$

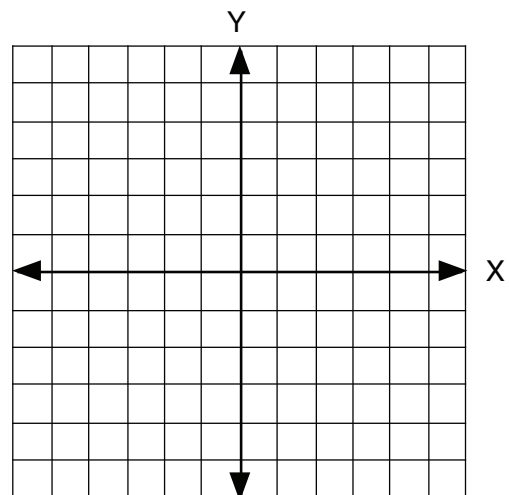V. Graph. *(10 points each)*

1) $Y = 2X^2$

2) $4X^2 + Y^2 = 16$

3) $Y = 3X + 1$

Geometry Placement Test

To receive the full benefit of this test, watch the student to ensure he has mastered the concepts presented in Geometry.

If he demonstrates proficiency, he is ready to move on to Algebra 2.

If he struggles with the material on this exam, he should begin in Geometry.

I. Fill in the blank with the best answer. (3 points each)

1) The trigonometric function defined as the adjacent side over the hypotenuse.

2) An angle with a measure greater than 90° but less than 180°.

3) A piece of the circumference of a circle.

4) Any two angles whose measure adds to 90°.

5) An infinite number of connected lines lying in the same flat surface; it has length

and width; two dimensional.

6) A four-sided polygon with two parallel sides and two sides that are not parallel.

7) A rectangular solid with all edges having the same length.

8) Two or more points on the same line.

9) Having the same size and shape.

10) Distance around any geometric shape.

II. Given the drawing at right, answer the following questions. (3 points each)

1) What kind of quadrilateral is quadrilateral ABDE?

2) What angle(s) correspond(s) to ∠10? (give all answers)

3) m∠6=

4) m∠5=

5) Given that segment DC is 8 cm, find the lengths of the other two sides of triangle BCD.

6) m∠14 =

7) Is the m∠2 = m∠11? Why or why not?

8) Name all the points given that are not collinear with point B as shown in this drawing.

9) ΔBCD ~ ΔACE Using your answers from #5 above, find the length of the segment AE if CE = 20.

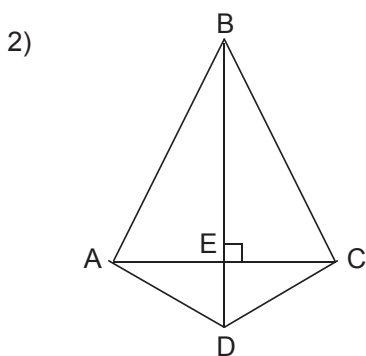10) Using your answers from #5 and #9, what would be the length of segment AB?

Given: $\overleftrightarrow{AE} \parallel \overleftrightarrow{BD}$

m∠8 = 60°

m∠4 = 90°
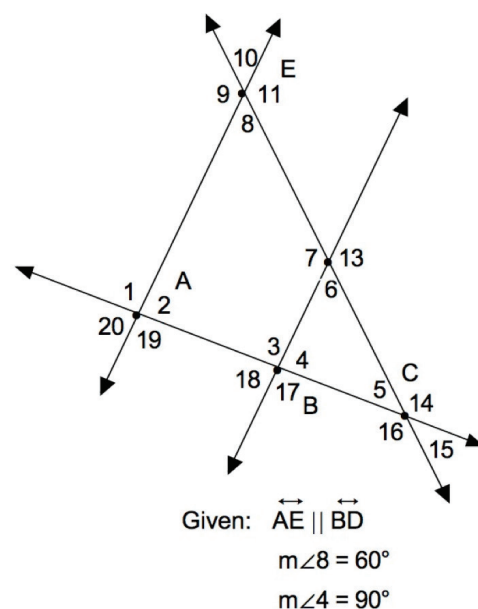
III. Write a proof for each of the following. (12 points each)

1)

	Statements	Reasons
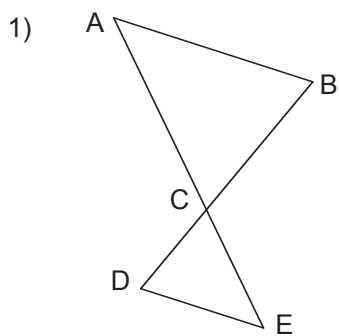
Given: $\overline{CE} \cong \overline{CA}$

$\angle B \cong \angle D$

Prove: $\triangle ABC \cong \triangle CDE$

Drawing is <u>not</u> to scale!

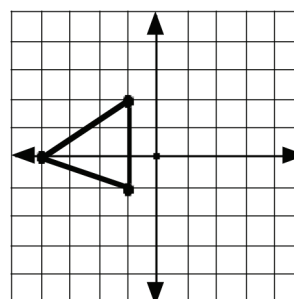2)

	Statements	Reasons

Given: $\overline{AB} \cong \overline{BC}$

Prove: $\overline{AE} \cong \overline{EC}$

IV. Graph the reflection of the triangle about the Y axis. (5 points)

V. Find the volume of a sphere if the radius is given as 3 cm. (5 points)

VI. Find the surface area of a rectangular solid with edges of length 2 cm, 5 cm, and 7 cm. (5 points)

VII. The measure of an exterior angle of a regular polygon is 45°. Name its shape. (5 points)

VIII. Simplify the following radical expressions, if possible. Reduce to to simplest terms. (4 points each)

1) $\left(3\sqrt{2}\right)\left(4\sqrt{22}\right)$

2) $\dfrac{4}{\sqrt{3}} - \dfrac{2\sqrt{6}}{\sqrt{2}}$

3) $-3\sqrt{5} + \sqrt{5}$

4) $\sqrt{2} + \sqrt{3} + \sqrt{4} + \sqrt{1}$

IX. Given that the circumference of a circle is $8p$, find the radius. (5 points)

X. Draw a segment 4 centimetres long. Now construct the perpendicular bisector to that segment. Measure your results to check. (5 points)

XI. If the length of the minor arc AC in the diagram below is 98°, give the the measures of the central angle and the inscribed angle shown. (5 points)
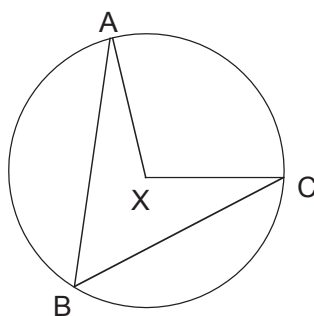
Given: X is the center of the circle

XII. If the hypotenuse of a right triangle is 5 cm and one leg is 2 cm, what is the measurement of the other leg? (5 points)

XIII. Given that sin q = 3/5, find the values of the other 5 trig functions. (10 points)

Algebra 2 Placement Test

To receive the full benefits of this test, watch the student to ensure he has mastered the concepts from Algebra 2.

If he demonstrates proficiency, he is ready to move on to Pre-Calculus Competency Exam.

Simplify or put in standard form.

1) $(X^7 \div X^3) + (X^2 \cdot X^2) =$

2) $\dfrac{A^5 B^{-3}}{B^3 A^2} =$

3) $\left(\dfrac{8}{27}\right)^{-\frac{1}{3}} =$

4) $2\sqrt{5} + 7\sqrt{5} =$

5) $\dfrac{X}{3 + i} =$

6) $\dfrac{3}{1 + \sqrt{3}} =$

Add or Subtract.

7) $\dfrac{5}{6X} + \dfrac{4}{3Y} =$

8) $5Q^{-1}R Q^2 + 3QR - R =$

Solve using scientific notation.

9) $(.0009)(.027) =$

10) $\dfrac{3{,}700{,}000}{.002} =$
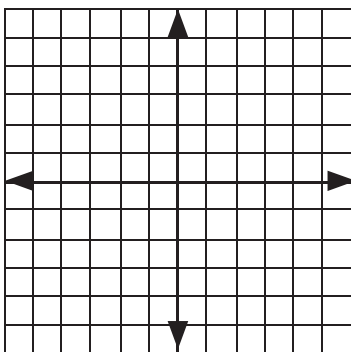
Solve for the unknown.

11) $2X^2 - 9X = 35$

12) $X^2 + 4X - 4 = -3X$

Find the solutions for each pair of equations. Sketch a graph of each equation and show the solutions.
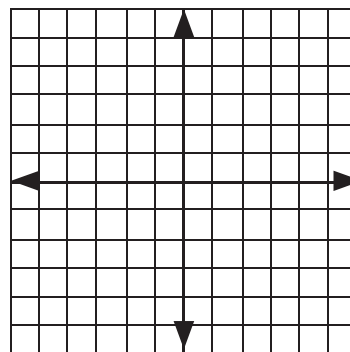
13) $Y = X^2 + 2$

   $Y = X + 2$

14) $X^2 + Y^2 = 1$

   $X^2 - Y^2 = 1$

Answer the questions.

15. A new computer is being discounted 15%. If the original price was $1,565, what is the new price?

16. The atomic weight of sodium (Na) is 23 and that of chlorine (Cl) is 35. What is the percentage of sodium in NaCl?

17. The ratio of cats to dogs is 5 to 18. If there are 10 cats, how many dogs are there?

18. There are 0.62 miles is 1 kilometre. How many miles are there in 10 kilometres?

19. Michael and Alexandra left their home at 8:00 AM to drive to New York. Michael drove at 55 kilometres an hour and arrived at 5:00 PM. Alexandra drove at 45 kilometres an hour and arrived at the same place as Michael. What time did Alexandra arrive?

20. I have 15 coins in my pocket from a recent trip to America. They are all either dimes (10¢) or quarters (25¢). The value of the coins is $3.15. How many of each coin do I have?

21. Find three consecutive even integers such that three times the first, plus two times the second, minus the third equals sixteen.

22. A landscaper wants 100 kilograms of grass seed mixture that is 45% of type A seed and 55% of type B. He has a mixture that is 10% type A and one that is 60% type A. How much of each should he use to make the desired mixture?

23. In six years Rose will be two times as old as Anne. Four years ago, Anne was one third the age of Rose. How old are they now?

24. A boat can go 26 kilometres downstream in the same time it takes to go 6 kilometres upstream. The rate of the water is 5 kilometres per hour. What is the rate of the boat?

CONTACT

02 9094 3390 or 08 6311 5998

info@mathsaustralia.com.au

WWW.MATHSAUSTRALIA.COM.AU