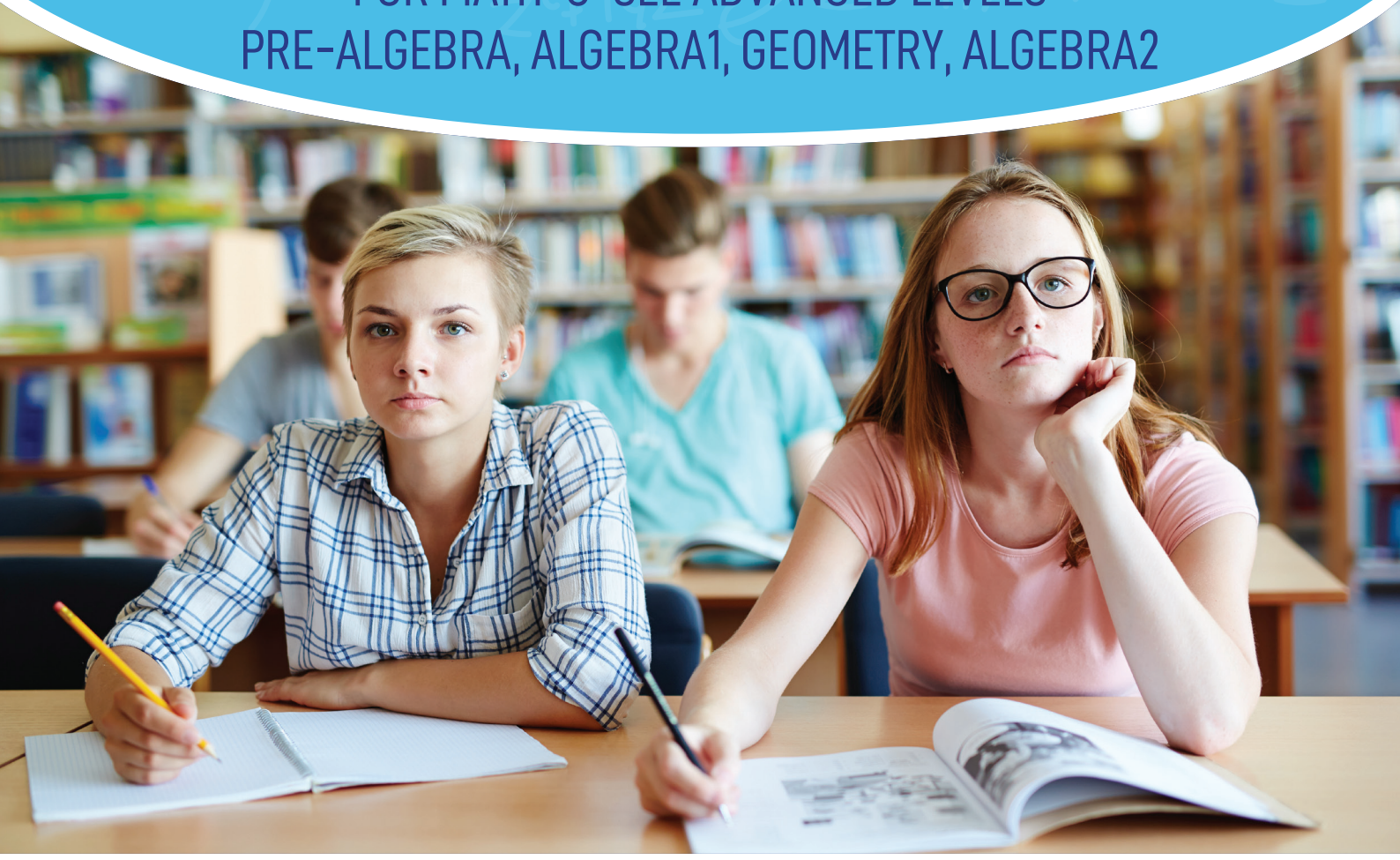
Maths Australia

PLACEMENT TEST
ANSWERS

FOR MATH-U-SEE ADVANCED LEVELS
PRE-ALGEBRA, ALGEBRA1, GEOMETRY, ALGEBRA2



MATHS AUSTRALIA

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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-Alpha Solutions

1) -33
2) 105
3) 17
4) -5
5) -1
6) -25
7) 64
8) $\frac{4}{9}$
9) $9 \times 10^1 + 5 \times 10^0 + 2 \times 10^{-1} + 1 \times 10^{-2} + 4 \times 10^{-3}$
10) 1,825.6
11) ±10
12) ±Y
13) $8 \cdot 2 + 5^2 - Y = 2(Y + 1) + 6$
$16 + 25 - Y = 2Y + 2 + 6$
$41 - Y = 2Y + 8$
$33 = 3Y$
$11 = Y$
14) $8 \cdot 2 + 5^2 - (11) = 2((11) + 1) + 6$
$16 + 25 - (11) = 2(11) + 2 + 6$
$41 - (11) = 22 + 8$
$30 = 30$
15) $8M - 4M - 6 - 3 + 5M = 8^2 - 1$
$9M - 9 = 64 - 1$
$9M = 63 + 9$
$9M = 72$
$M = 8$
16) $8(8) - 4(8) - 6 - 3 + 5(8) = 8^2 - 1$
$64 - 32 - 9 + 40 = 64 - 1$
$63 = 63$
17) $(-3)^2 \div 9 + 6 = D$
$9 \div 9 + 6 = D$
$1 + 6 = D$
$7 = D$
18) $(-3)^2 \div 9 + 6 = (7)$
$9 \div 9 + 6 = (7)$
$1 + 6 = (7)$
$7 = (7)$
19) Y = 56
20) 12A = 528
A = 44
21) \$-500 ÷ 10 = \$-50
22) A + 5 = 39
A + 5 - 5 = 39 = 5
A = 34
23) 3X + 8 = 2X + 10
3X = 2X + 2
X = 2
24) $3^2 + 4^2 = 5^2$
9 + 16 = 25
25 = 25; yes
25) $\frac{1}{8} = \frac{X}{24}$
8X = 24
X = 3 students
26) 2(15 x 13) + 2(15 x 10) + 2(13 x 10) =
2(195) + 2(150) + 2(130) =
390 + 300 + 260 = 950 sq.m.

Algebra 1 Solutions

I. 1) $1/4 + 1 - 9 = -31/4 = -7\ 3/4$

2) $\pm 4X$

3) $3^{XY + X}$

4) 2

5) $X + 2$

6) 9^{-3}

7) $3X^2 + 20X^6 + 5X^2 = 8X^2 + 20X^6$

II. 1) $3(X^2 - 9) = 3(X - 3)(X + 3)$

2) $(5X + 1)(X - 2)$

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

4) $7(2Y^2 - Y - 6) = 7(2Y + 3)(Y - 2)$

III. $10^6 = (10^3)^X$, $6 = 3X$, $X = 2$

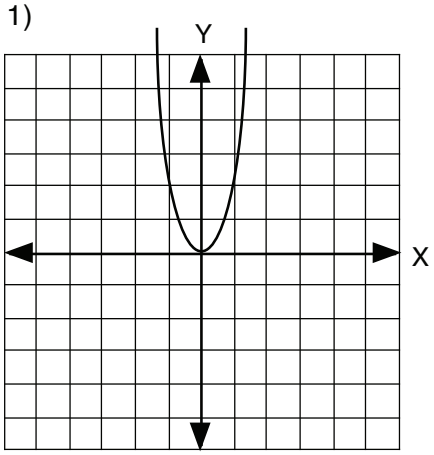
IV. 1) $3X(X - 2) = 0$
$3X(X - 2) = 0$
$X = 0,\ X = 2$

2) $6X - 15 = 20$ (multiplying by 30)
$6X = 35,\ X = 35/6$

3) $8 + 14X - X^2 = 16X$ (multiplying by 4X)
$-X^2 - 2X + 8 = 0$
$X^2 + 2X - 8 = 0$
$(X - 2)(X + 4) = 0$
$X = 2,\ X = -4$

V. on the graphs

1)



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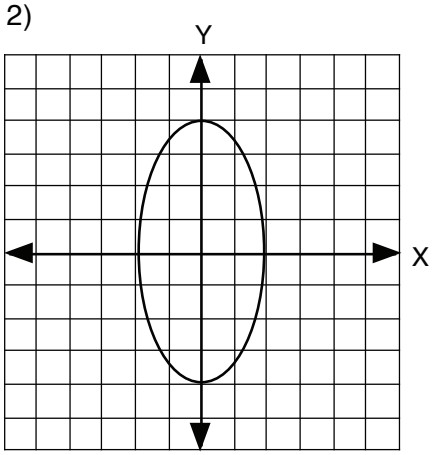
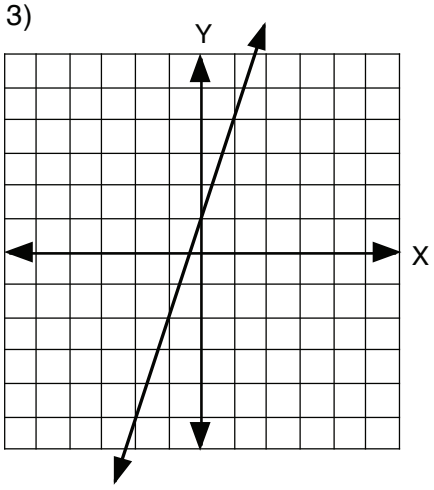


3)



Geometry Solutions

I. 1) cosine
2) obtuse
3) arc
4) complementary
5) plane
6) trapezoid
7) cube
8) collinear
9) congruent
10) perimeter

II. 1) trapezoid

2) $\angle 12$

3) 60° (corresponding angles)

4) 30° (180° in a triangle)

5) use answers to #4 and 5 and rules for 30°-60°-90° triangle
BD = 4 and BC = $4\sqrt{3}$

6) 150° (remote exterior angles)

7) no, $\overleftrightarrow{EC}$ is not parallel to $\overleftrightarrow{AC}$

8) E

9) $\frac{20}{8} = \frac{X}{4}$ $X = AE = 10$

10) use rules for 30°-60°-90° triangle
AC = $10\sqrt{3}$; AB = $10\sqrt{3} - 4\sqrt{3} = 6\sqrt{3}$

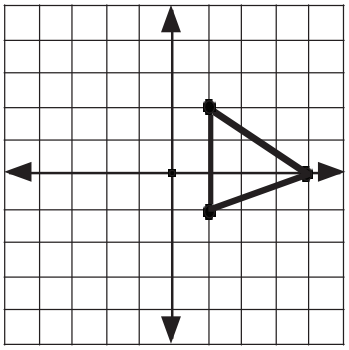
III. 1)

$\overline{CE} \cong \overline{CA}$	given
$\angle B \cong \angle D$	given
$\angle ACB \cong \angle DCE$	vertical angles
$\Delta ABC \cong \Delta CDE$	AAS

2)

$\overline{AB} \cong \overline{BC}$	given
$\angle BEC$ is a right $\angle$	given
$\angle BEA$ is a right $\angle$	supplementary
$\overline{BE} \cong \overline{BE}$	reflexive
$\Delta ABE \cong \Delta EBC$	HL
$\overline{AE} \cong \overline{EC}$	CPCTRC

IV.



V. $(4/3)(22/7)(3)^3 = 113.14$ cu. cm (rounded)
using decimal value of p yields 113.04

VI. first find the area of each face of the solid
$2(10\ cm^2) + 2(35\ cm^2) + 2(14\ cm^2) = 118\ cm^2$

VII. 360° ÷ 45° = 8 sides, octagon

VIII. 1) $(3\sqrt{2})(4\sqrt{22}) = 12\sqrt{44} = 24\sqrt{11}$

2) $\frac{4}{\sqrt{3}} - \frac{2\sqrt{6}}{\sqrt{2}} = \frac{4\sqrt{3}}{3} - \frac{2\sqrt{3}}{1} =$
$\frac{4\sqrt{3} - 6\sqrt{3}}{3} = \frac{-2\sqrt{3}}{3}$

3) $-3\sqrt{5} + \sqrt{5} = -2\sqrt{5}$

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

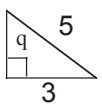
IX. $C = pd$ so diameter is 8 and radius is 4

X. check by measuring - each side of the bisected segment should be 2 cms

XI. central angle = 98°,
inscribed angle = (1/2)(98) = 49°

XII. $2^2 + L^2 = 5^2$
$4 + L^2 = 25$, $L = 21^2$, $L = \sqrt{21}$

XIII.



$\sin q = \frac{3}{5}$ $\csc q = \frac{5}{3}$

$\cos q = \frac{4}{5}$ $\sec q = \frac{5}{4}$

$\tan q = \frac{3}{4}$ $\cot q = \frac{4}{3}$

Algebra 2 Solutions

1) $(X^7 \div X^3)+(X^2 \cdot X^2)=X^{7-3}+X^{2+2}=X^4+X^4=2X^4$

2) $\frac{A^5B^{-3}}{B^3A^2}=A^{5-2}B^{-3-3}=A^3B^{-6}\ \text{OR}\ \frac{A^3}{B^6}$

3) $\left(\frac{-8}{27}\right)^{-\frac{1}{3}}=\left(\frac{27}{8}\right)^{\frac{1}{3}}=\frac{3}{2}=1\frac{1}{2}$

4) $2\sqrt{5}+7\sqrt{5}=9\sqrt{5}$

5) $\left(\frac{X}{3+i}\right)\left(\frac{3-i}{3-i}\right)=\frac{X(3-i)}{3^2-i^2}=\frac{X(3-i)}{9-(-1)}=\frac{X(3-i)}{10}$

6) $\left(\frac{-3}{1+\sqrt{3}}\right)\left(\frac{1-\sqrt{3}}{1-\sqrt{3}}\right)=\frac{3(1-\sqrt{3})}{1^2-\sqrt{3}^2}=\frac{3(1-\sqrt{3})}{1-3}=\frac{3-3\sqrt{3}}{-2}$

7) $\frac{5}{6X}+\frac{4}{3Y}=\left(\frac{5}{6X}\right)\left(\frac{Y}{Y}\right)+\left(\frac{4}{3Y}\right)\left(\frac{2X}{2X}\right)=$
$\frac{5Y}{6XY}+\frac{4(2X)}{6XY}=\frac{5Y+8X}{6XY}$

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

9) $(9\times 10^{-4})(2.7\times 10^{-2})=(9\times 2.7)(10^{-4}10^{-2})=$

$24.3\times 10^{-6}\ \text{or}\ 2.43\times 10^{-5}$

10) $\frac{3.7\times 10^6}{2\times 10^{-3}}=\frac{3.7}{2}\times 10^9=1.85\times 10^9=1,850,000,000$

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

$2X^2-9X-35=0$

$X=\frac{-(-9)\pm\sqrt{(-9)^2-4(2)(-35)}}{2(2)}$

$X=\frac{9\pm\sqrt{81-(-280)}}{4}=\frac{9\pm\sqrt{361}}{4}=\frac{9\pm 19}{4}$

$X=\frac{9+19}{4}=\frac{28}{4}=7,\ X=\frac{9-19}{4}=\frac{-10}{4}=-2\frac{1}{2}$

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

$X^2+7X-4=0$

$X=\frac{-(7)\pm\sqrt{7^2-4(1)(-4)}}{2(1)}$

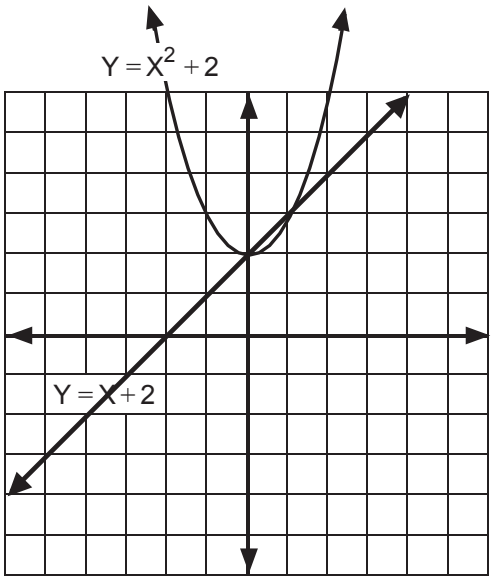
$X=\frac{-7\pm\sqrt{49-(-16)}}{2}$

$X=\frac{-7\pm\sqrt{65}}{2}$

$X=\frac{-7+\sqrt{65}}{2},\ X=\frac{-7-\sqrt{65}}{2}$

13) $Y=X^2+2$
$Y=X+2$
substitute $X+2$ for Y:
$(X+2)=X^2+2$
$X=X^2$
$X^2-X=0$
$(X)(X-1)=0$

$X=0$	$X=1$
$Y=(0)+2$	$Y=(1)+2$
$Y=2$	$Y=3$
$(0,2)$	$(1,3)$



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

$\underline{X^2 - Y^2 = 1}$

$2X^2 = 2$

$X^2 = 1$

$X = \pm 1$

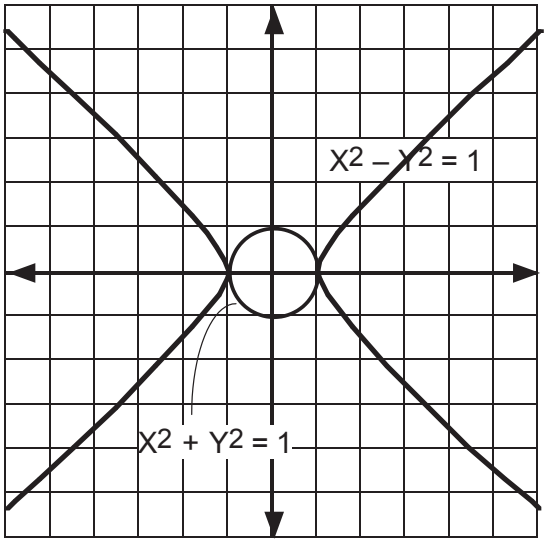
$(1)^2 + Y^2 = 1$ $\quad$ $(-1)^2 + Y^2 = 1$

$1 + Y^2 = 1$ $\quad$ $1 + Y^2 = 1$

$Y^2 = 0$ $\quad$ $Y^2 = 0$

$Y = 0$ $\quad$ $Y = 0$

$(1, 0)$ $\quad$ $(-1, 0)$



15) .15 x $1,565 = $234.75 off
$1,565 - $234.75 = $1330.25

16) 23 = WP x (35 + 23)
23 = WP x 58
23 ÷ 58 = WP
WP = 40% (rounded)

17) $\frac{C}{D} = \frac{5}{18}$

$\frac{10}{D} = \frac{5}{18}$

$5D = (10)(18)$

$D = (2)(18)$

$D = 36$

18) .62 · 10 = 6.2 mi.

19) $D_M = R_M T_M$
$D_M = (55)(9)$
$D_M = 495!mi.$
$D_A = R_A T_A$
$D_M = D_A$
$715 = 45(T_A)$
$T_A = 11!hours$
arrived at 7:00 PM

20) D + Q = 15
.10D + .25Q = 3.15
10D + 25Q = 315
-(10D + 10Q = 150) (1st equation x 10)
15Q = 165

Q = 11
D + (11) = 15
D = 4

21) $3(X) + 2(X + 2) - (X + 4) = 16$
$3X + 2X + 4 - X - 4 = 16$
$4X = 16$
$X = 4$
3 numbers are 4, 6, and 8

22) $M_T + M_S = 100$
$.10M_T + .60M_S = .55(100)$
$10M_T + 60M_S = 5{,}500$ (2nd equation x 100)
– ($\underline{10M_T + 10M_S = 1{,}000}$) (1st equation x 10)
$50M_S = 4{,}500$

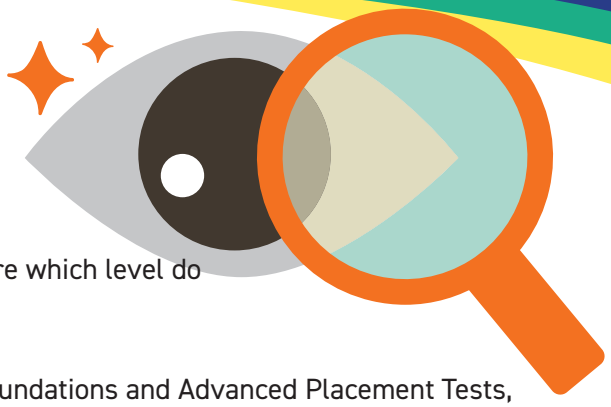
$M_S = 90$ kg
$M_T + (90) = 100$
$M_T = 10$ kg

23) R + 6 = 2(A + 6) (equation 1)
R + 6 = 2A + 12
R = 2A + 6
(A - 4) · 3 = R - 4 (equation 2)
(A - 4) · 3 = (2A + 6) - 4 (substitute for R)
3A - 12 = 2A + 2
A = 2 + 12 = 14 years old
R = 2(14) + 6
R = 28 + 6 = 34 years old

24) $D_D = R_D T_D$
$26 = (B + W)(T)$ $\quad$ $(T_U = T_D)$
$26 = (B + 5)T$

$T = \frac{26}{B + 5}$ $\quad$ $T = \frac{6}{B - 5}$

$D_U = R_U T_U$ $\quad$ $\frac{26}{B + 5} = \frac{6}{B - 5}$
$6 = (B - W)(T)$ $\quad$ $6(B + 5) = 26(B - 5)$
$6 = (B - 5)T$ $\quad$ $6B + 30 = 26B - 130$
$160 = 20B$
$8 = B$



Observe Your Student(s) as they progress

At which level did your student begin to struggle, and therefore which level do you need to order? _____

NOTE: If your student has successfully completed all of the Foundations and Advanced Placement Tests, scoring 90% or more on each test, consider Math-U-Sees Pre-Calculus or Calculus Levels. See a complete overview of Pre-Calculus and Calculus here: Math-U-See Level by Level.

Ready to Order?

Now that you have finished the Advanced Level Placement Tests, you can feel confident that you are choosing the level of Math-U-See that is best for your student.

Click your level below to order:

PARENTS	SCHOOLS	TUTORS
PRE ALGEBRA	PRE ALGEBRA	PRE ALGEBRA
ALGEBRA 1	ALGEBRA 1	ALGEBRA 1
GEOMETRY	GEOMETRY	GEOMETRY
ALGEBRA 2	ALGEBRA 2	ALGEBRA 2
PRE CALCULUS	PRE CALCULUS	PRE CALCULUS
CALCULUS	CALCULUS	CALCULUS

WE TAKE THE STRUGGLE OUT OF MATHS!

Math-U-See is an effective, hands-on and multi-sensory way to learn maths.

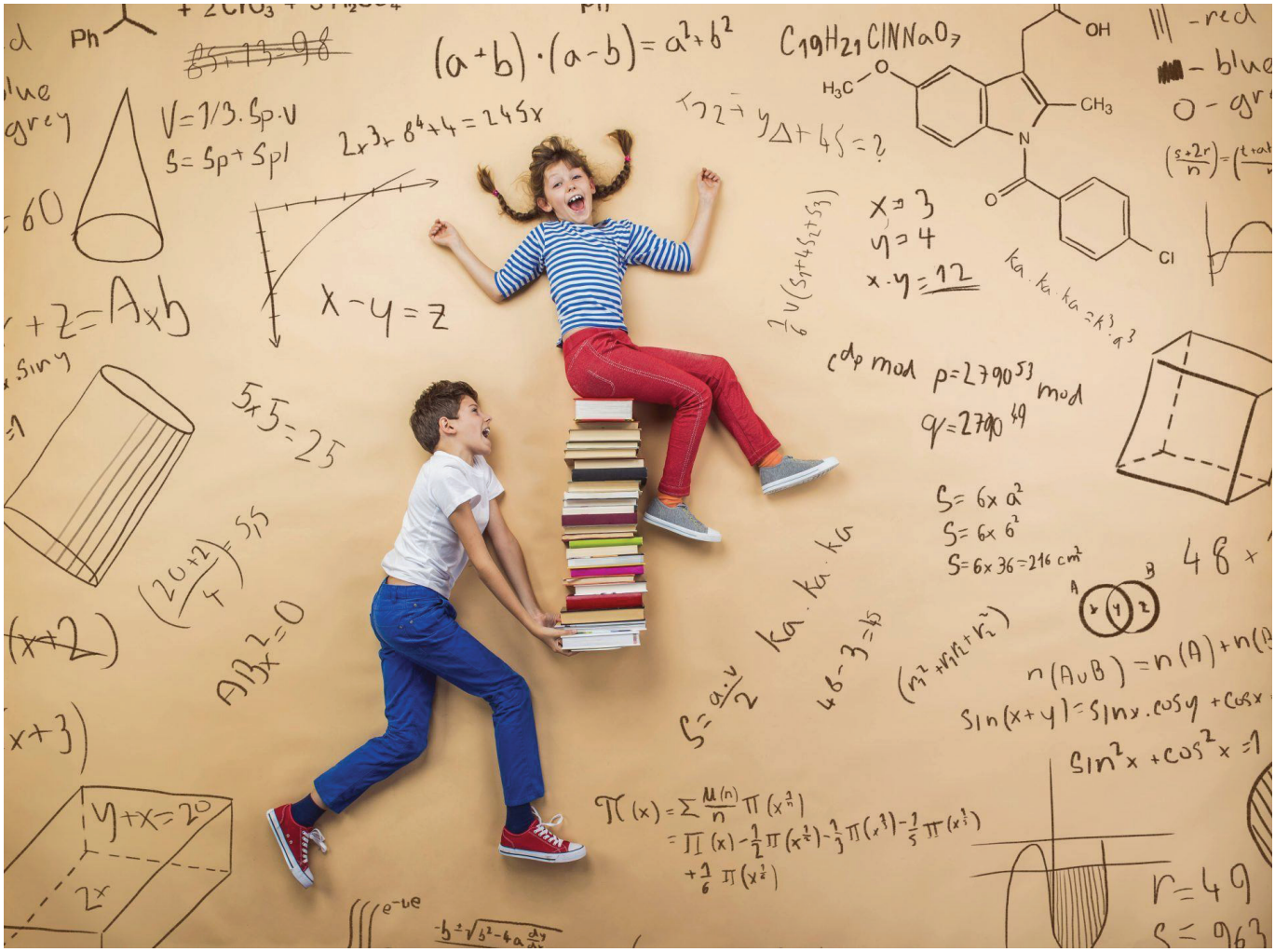
Dive into this student paced, multisensory program that teaches true maths mastery skills to help your student(s) become confident problem solvers for life.

Based on research, this award-winning program comes with complete and comprehensive instruction with just 4 Easy Steps to follow at each lesson!

Do you have any questions?

Our friendly, experienced team are dedicated to your success, every step of the way! Feel free to contact us and ask any questions you have. We look forward to hearing from you.

CONTACT US



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