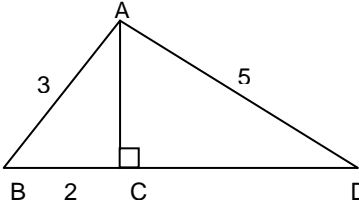
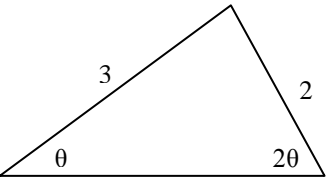
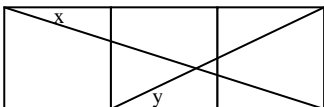
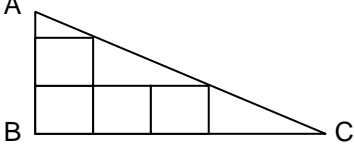
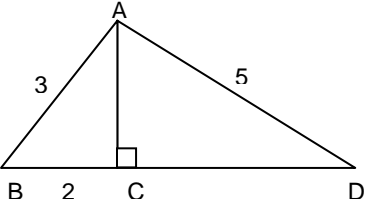


<p>A1 Find the smallest positive number k such that the parabola $y = x^2 + kx + 9$ intersects the x-axis.</p>	<p>A2 Find the smallest number k such that $(x-3)^2 + (y-4)^2 = k$ intersects the y-axis.</p>	<p>A3 $\cos\theta = 1/3$. Evaluate and simplify $\tan^2\theta$.</p>	<p>A4 Evaluate and simplify $r - r^{-1}$ when r is a solution of $x = \sqrt{1+x}$.</p>	<p>A5 Solve: $\log_{10}(x^2 - 8x - 9) = 3 + \log_{10}(2x + 2)$</p>
<p>A6 Find the least number of people needed to ensure that at least three were born in the same month.</p>	<p>A7 Solve: $x x + x + 2 = 0$</p>	<p>A8 Find the perimeter of a regular hexagon inscribed in a circle of circumference 18π.</p>	<p>A9 $\angle ACD = 90^\circ$ $AB = 3, BC = 2, AD = 5$. Find the area of $\triangle ACD$.</p> 	<p>A10 Find the x coordinate of the reflection of the point $(2,0)$ across the line $y = \sqrt{3}x$.</p>
<p>A11 Let $f(x) = 1 + x + x^2 + x^4 + x^8 + x^{16} + x^{32}$. Simplify $\frac{f(x^2) - f(x)}{x^{63} - 1}$</p>	<p>A12 The circle $x^2 - 2x + y^2 - 2y = 0$ has tangent line $x + y = k$ for $k \neq 0$. Find k.</p>	<p>A13 Let a and b be the two roots of $x^2 + 3x + 1$. Evaluate and simplify $ab(a + b)$.</p>	<p>A14</p>  <p>Evaluate $\cos\theta$.</p>	<p>A15 Solve for x: $(1+x)^{3/2} = 3x - 1$</p>
<p>A16 Let $f(x) = 2009x + 2000$. Solve for x: $f^1(2x + 5) = -1$</p>	<p>A17 How many revolutions does a wheel of radius 9 inches require to roll 300π feet?</p>	<p>A18 Two positive integers differ by more than 1. Their squares differ by 77. Find the larger integer.</p>	<p>A19 Simplify $(i + 2)^3 - (i - 2)^3$ where $i^2 = -1$.</p>	<p>A20 Sara is $2/5$ as old as she will be 10 years after she is twice her present age. How old is she now?</p>

<p>A21 Find the y-intercept of the perpendicular bisector of the points (1,0) and (5,2).</p>	<p>A22 If $S = 1 + 2 + 4 + \dots + 2^{2009}$, how many positive integers are factors of $S + 1$ (including 1 and itself)?</p>	<p>A23 Simplify $\frac{\sin(80^\circ) - \cos(50^\circ)}{\sin(40^\circ) - \cos(10^\circ)}$</p>	<p>A24 $x - \frac{1}{x} = 3$ $x^2 + \frac{1}{x^2} = ?$</p>	<p>A25 Find the area of the circle through the points (0,0), (3,0), and (0,1).</p>
<p>A26 Solve for x: $\log_3 x = 2 + \log_9 x.$</p>	<p>A27 What is the sum of the x-coordinates of the two points of intersection of $xy = 1$ and $x + y = 3$?</p>	<p>A28 $y = 1 - x$ $x^3 + y^3 = 7$ $x > 0$ Find x.</p>	<p>A29 Let $i^2 = -1$ Let $(a + bi)^2 = i$ for real numbers a and b. Evaluate a^2.</p>	<p>A30 For what real number k does the function $f(x) = x^2 + kx$ satisfy the relation $f(x) = f(6 - x)$ for all x?</p>
<p>A31 A cube has sides of length 1. How long is a diagonal of the cube?</p>	<p>A32  The figure shows three squares. Evaluate and simplify $\tan(x + y)$.</p>	<p>A33 For how many <u>positive</u> integers c does $x^2 + 7x + c$ have rational roots?</p>	<p>A34 Solve for x: $\log_3(2x + 5) + \log_{1/3}(x + 1) = 1$</p>	<p>A35 Simplify $(3 + \sqrt{5})^2(3 - \sqrt{5}) + (3 + \sqrt{5})(3 - \sqrt{5})^2.$</p>
<p>A36 Find the minimum value of $x^4 + 4x^3 + 6x^2 + 4x + 2009$ for all real numbers x.</p>	<p>A37 (k,k) and (0,0) are points on a circle with center (4,2). If $k \neq 0$, find k.</p>	<p>A38 Solve: $\frac{(x^{2009})^{2011}}{(x^{2008})^{2012}} = 8$</p>	<p>A39 Simplify $(2009 + 2009^{-1})^2 - (2009 - 2009^{-1})^2$</p>	<p>A40 Simplify $\sqrt{2009 \cdot 41}$</p>

<p>B1 Solve:</p> $\sqrt{x+7} = \sqrt{x} + 1.$	<p>B2 Find the y-intercept of the perpendicular bisector of the points (1,0) and (5,2).</p>	<p>B3 Simplify</p> $\frac{(\sqrt{2} + \sqrt{6})^2}{2 + \sqrt{3}}$	<p>B4 Simplify</p> $\frac{2 + \sqrt{6}}{\sqrt{2} + \sqrt{3}}$	<p>B5 How many revolutions does a wheel of radius 9 inches require to roll 300π feet?</p>
<p>B6 Let a and b be the two roots of $x^2 + 3x + 1$. Evaluate and simplify $ab(a + b)$.</p>	<p>B7 The circle $x^2 - 2x + y^2 - 2y = 0$ has tangent line $x + y = k$ for $k \neq 0$. Find k.</p>	<p>B8 Evaluate and simplify $r - r^{-1}$ when r is a solution of $x = \sqrt{1 + x}$.</p>	<p>B9 (k,k) and (0,0) are points on a circle with center (4,2). If $k \neq 0$, find k.</p>	<p>B10 x and y are integers. $18^x 12^y = 96$ $x = ?$</p>
<p>B11 Find the area of the circle through the points (0,0), (3,0), and (0,1).</p>	<p>B12 Simplify</p> $(3 + \sqrt{5})^2(3 - \sqrt{5}) + (3 + \sqrt{5})(3 - \sqrt{5})^2.$	<p>B 13 The four squares each have sides of length 2. Find the area of triangle ABC.</p> 	<p>B14 Solve for x.</p> $\left((3x^{-1} + 2)^{-1} + 4 \right)^{-1} = \frac{1}{3}$	<p>B15 Find the x-intercept of the line through (2,10) that doesn't intersect the line $2x + y = 7$.</p>
<p>B16 $12x^{-2} = x + 1$ Find the real number x.</p>	<p>B17 The points (a,b) and (-1,2) have the same midpoint as (1,3) and (5,9). Find (a,b).</p>	<p>B18 Sara is $\frac{2}{5}$ as old as she will be 10 years after she is twice her present age. How old is she now?</p>	<p>B19 Simplify</p> $\frac{(x^2 - y^2)(x^2 + xy + y^2)}{x^3 - y^3}$	<p>B20 Find the perimeter of a regular hexagon inscribed in a circle of circumference 18π.</p>

<p>B21 Two positive integers differ by more than 1. Their squares differ by 77. Find the larger integer.</p>	<p>B22 For what real number c does $2x^2 - 5x + c = 0$ have roots that are reciprocals?</p>	<p>B23 $x - \frac{1}{x} = 3$ $x^2 + \frac{1}{x^2} = ?$</p>	<p>B24 $\angle ACD = 90^\circ$ $AB = 3, BC = 2, AD = 5.$ Find the area of $\triangle ACD$.</p> 	<p>B25 Solve: $\frac{(x^{2009})^{2011}}{(x^{2008})^{2012}} = 8$</p>
<p>B26 Find the smallest positive number k such that the parabola $y = x^2 + kx + 9$ intersects the x-axis.</p>	<p>B27 Find the smallest number k such that $(x-3)^2 + (y-4)^2 = k$ intersects the y-axis.</p>	<p>B28 Find the minimum value of $x^4 + 4x^3 + 6x^2 + 4x + 2009$ for all real numbers x.</p>	<p>B29 A cube has sides of length 1. How long is a diagonal of the cube?</p>	<p>B30 Find the value of x if $(x + 1)^3 + (x - 1)^3 = 24x$ and $x > 0$.</p>
<p>B31 Solve: $x x + x + 2 = 0$</p>	<p>B32 $y = 1 - x$ $x^3 + y^3 = 7$ $x > 0$ Find x.</p>	<p>B33 Find the least number of people needed to ensure that at least three were born in the same month.</p>	<p>B34 $x^2 + (2k + 1)x + k^2 = 0$ has exactly one solution x. Find k.</p>	<p>B35 For how many <u>positive</u> integers c does $x^2 + 7x + c$ have rational roots?</p>
<p>B36 Evaluate $50506^2 - 50505^2 - 1$</p>	<p>B37 Solve for x: $(1 + x)^{3/2} = 3x - 1$</p>	<p>B38 Solve: $\frac{x^3 + 8}{x^2 - 2x + 4} = 2009$</p>	<p>B39 Simplify $(2009 + 2009^{-1})^2 - (2009 - 2009^{-1})^2$</p>	<p>B40 Simplify $\sqrt{2009 \cdot 41}$</p>