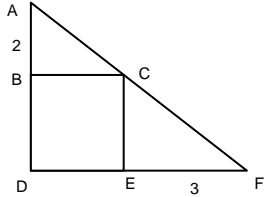
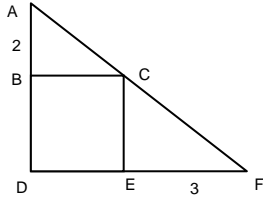


<p>A1 Find x if <math>1 + 3(10x^{-1} - x)^{-1} = 0</math> and <math>x &gt; 0</math>.</p>	<p>A2 Find the area of the triangle formed by the lines <math>x + y = 10</math> <math>x = 6</math>, and <math>y = 8</math>.</p>	<p>A3 <math>\sin(5\theta) = -1</math> <math>0^\circ &lt; \theta &lt; 90^\circ</math> Find <math>\theta</math> in degrees.</p>	<p>A4 Simplify <math>5 \log_{10}(8,000,000) - 3 \log_{10}(3200)</math>.</p>	<p>A5 For how many 3-digit integers are the first two digits unequal and the last two digits unequal?</p>
<p>A6 <math>f(x) = x^2 - 4x</math> for all x. Solve for a: <math>f(a + 3) = 1 + f(a)</math>.</p>	<p>A7 The points (a,b) and (-b,a) have midpoint (1,3). Evaluate a.</p>	<p>A8 Solve for x: <math>\frac{3}{x^2} + \frac{1}{(x-1)^2} + \frac{2}{x^2(x-1)} = 0</math></p>	<p>A9 <math>\sin \theta = \frac{2}{3}</math>. Evaluate <math>\tan^2 \theta</math>.</p>	<p>A10 Simplify <math display="block">\frac{(xy^2 - 1)^2}{x^{-2}y^{-4} - 2x^{-1}y^{-2} + 1}</math></p>
<p>A11 AB = 2. EF = 3. BCED is a square. Find the area of this square.</p> 	<p>A12 What is the remainder when <math>(x + 1)^5</math> is divided by <math>x^2</math>?</p>	<p>A13 What is the slope of the tangent line to the circle <math>x^2 - 6x + y^2 - 6y = 0</math> at the origin?</p>	<p>A14 One root of <math>x^2 - 12x + k</math> is 3 times another root. Find k.</p>	<p>A15 <math>\log_2(x + 3) = 1 + \log_2(x)</math> <math>x = ?</math></p>
<p>A16 <math>\sqrt{x} = 2x^{\frac{1}{3}}</math> <math>x \neq 0</math> <math>x = ?</math></p>	<p>A17 How many points (x,y) with integer coordinates x and y lie inside the graph of <math>x^2 + 10x + y^2 + 12y + 58 = 0</math>?</p>	<p>A18 Simplify <math>z^3</math> for <math>z = 1 + i\sqrt{3}</math> with <math>i^2 = -1</math>.</p>	<p>A19 <math>2 x  =  x - 6 </math> <math>x &lt; 0</math> <math>x = ?</math></p>	<p>A20 <math>a_1 = 2</math> <math>a_n = \frac{1}{a_{n-1}}</math> for <math>n &gt; 1</math> Evaluate <math>a_1 + a_2 + a_3 + \dots + a_{2004}</math></p>

<p>A21 Find the area of the region enclosed by the following graphs.  <math>y = x</math>  <math>y = -x</math>  <math>y = x + 6</math>  <math>y = -x + 6</math></p>	<p>A22 Solve for <math>x</math>:  <math>\sqrt{x+101} - \sqrt{x} = 1.</math></p>	<p>A23 What is the area of the circle having a diameter with endpoints (2,1) and (4,3)?</p>	<p>A24 If <math>0^\circ &lt; x &lt; 180^\circ</math>, solve for <math>x</math>:  <math>7 \cos(x) = 4 + \cos(2x).</math></p>	<p>A25 Jane is half as old as she will be 15 years before she is 3 times her age last year. How old is she now?</p>
<p>A26  <math>4^x 16^y = 1</math>  <math>2^x 8^y = \frac{1}{2}</math>  <math>x = ?</math></p>	<p>A27  <math>f(x) = 2x</math> for all <math>x</math>. Evaluate  <math>f(3 + f^{-1}(2004)).</math></p>	<p>A28  <math>y = x</math> is the perpendicular bisector of (3,-1) and (r,s).  <math>r = ?</math></p>	<p>A29 How many revolutions does a wheel of radius <math>\frac{3}{2}</math> ft. require to roll <math>24\pi</math> ft. without slipping?</p>	<p>A30 Solve for <math>z</math>:  <math>2x - y - z = 1</math>  <math>-x + 2y - z = 4</math>  <math>-x - y + 3z = 2</math></p>
<p>A31  <math>\sin(2\theta) = \sin(\theta)</math>  <math>0^\circ &lt; \theta &lt; 90^\circ</math> Find <math>\theta</math> in degrees.</p>	<p>A32 A right triangle has hypotenuse of length 5 and perimeter 12. What is its area?</p>	<p>A33  <math>S = \frac{1}{2!} + \frac{2}{3!} + \frac{3}{4!} + \frac{4}{5!}</math> Simplify  <math>S + \frac{1}{5!}.</math> Recall that  <math>n! = n(n-1) \cdots 1.</math></p>	<p>A34 What is the sum of the first 2004 positive integers?</p>	<p>A35  <math>\log_{10}\left(\frac{1}{2}\right) + \log_{10}\left(\frac{2}{3}\right) + \dots + \log_{10}\left(\frac{n}{n+1}\right) + 2 = 0.</math>   <math>n = ?</math></p>
<p>A36 How many 6-digit integers have four 5's and two 7's as digits?</p>	<p>A37 Evaluate  <math>(\sin\theta + \cos\theta)^2</math> when <math>\sin(2\theta) = -\frac{1}{3}.</math></p>	<p>A38 A drawer has 2 black and 3 white socks. You take out 2 socks at random. What is the probability they match?</p>	<p>A39 Evaluate  <math>(4445)^2 - (4444)^2</math></p>	<p>A40 What is the least positive integer <math>n</math> such that  <math>1 + 2 + 2^2 + 2^3 + \dots + 2^n</math> is greater than 2004?</p>

<p>B1</p> <p>Find <math>x</math> if  <math>1 + 3(10x^{-1} - x)^{-1} = 0</math>  and <math>x &gt; 0</math>.</p>	<p>B2</p> <p>Find the area of the triangle formed by the lines  <math>x + y = 10</math>  <math>x = 6</math>, and <math>y = 8</math>.</p>	<p>B3</p> <p>How many positive integers (including 1) are factors of both <math>63^4</math> and <math>33^5</math>?</p>	<p>B4</p> <p>What is the angle in degrees at a vertex of a regular octagon?</p>	<p>B5</p> <p>For how many 3-digit integers are the first two digits unequal and the last two digits unequal?</p>
<p>B6</p> <p><math>x - y = 15</math>  <math>\sqrt{x} - \sqrt{y} = 3</math>  <math>x = ?</math></p>	<p>B7</p> <p>The points <math>(a,b)</math> and <math>(-b,a)</math> have midpoint <math>(1,3)</math>.  Evaluate <math>a</math>.</p>	<p>B8</p> <p>Solve for <math>x</math>:</p> $\frac{3}{x^2} + \frac{1}{(x-1)^2} + \frac{2}{x^2(x-1)} = 0$	<p>B9</p> <p>A rhombus has area 12 and a diagonal of length 4.  How long is the other diagonal?</p>	<p>B10</p> <p>Simplify</p> $\frac{(xy^2 - 1)^2}{x^{-2}y^{-4} - 2x^{-1}y^{-2} + 1}$
<p>B11</p> <p><math>AB = 2</math>. <math>EF = 3</math>.  <math>BCED</math> is a square.  Find the area of this square.</p> 	<p>B12</p> <p>What is the remainder when <math>(x + 1)^5</math> is divided by <math>x^2</math>?</p>	<p>B13</p> <p><math>12^r 24^s = 9</math> for integers <math>r</math> and <math>s</math>.  Find <math>r</math>.</p>	<p>B14</p> <p>One root of <math>x^2 - 12x + k</math> is 3 times another root.  Find <math>k</math>.</p>	<p>B15</p> <p>For what <math>k &gt; 0</math> do <math>y = -x + k</math> and <math>x^2 + y^2 = 18</math> intersect exactly once?</p>
<p>B16</p> <p><math>\sqrt{x} = 2x^{1/3}</math>  <math>x \neq 0</math>  <math>x = ?</math></p>	<p>B17</p> <p>How many points <math>(x,y)</math> with integer coordinates lie on the circle of radius <math>\sqrt{17}</math> centered at the origin?</p>	<p>B18</p> <p>For what positive number <math>r</math> does <math>x^2 + rx + 3r</math> have exactly one root?</p>	<p>B19</p> <p><math>2 x  =  x - 6 </math>  <math>x &lt; 0</math>  <math>x = ?</math></p>	<p>B20</p> <p><math>a_1 = 2</math>  <math>a_n = \frac{1}{a_{n-1}}</math> for <math>n &gt; 1</math>  Evaluate  <math>a_1 + a_2 + a_3 + \dots + a_{2004}</math></p>

<p>B21 Find the area of the region enclosed by the following graphs.</p> $y = x$ $y = -x$ $y = x + 6$ $y = -x + 6$	<p>B22 Solve for x:</p> $\sqrt{x + 101} - \sqrt{x} = 1.$	<p>B23 What is the area of the circle having a diameter with endpoints (2,1) and (4,3)?</p>	<p>B24</p> $a^2 + b^2 = 10$ $a^2 + (b - 6)^2 = 10$ $a > 0$ $a = ?$	<p>B25 Jane is half as old as she will be 15 years before she is 3 times her age last year. How old is she now?</p>
<p>B26</p> $4^x 16^y = 1$ $2^x 8^y = \frac{1}{2}$ $x = ?$	<p>B27 What is the slope of the tangent line to the circle <math>x^2 + y^2 = 5</math> at (2,1)?</p>	<p>B28 Simplify <math>r + r^{-1}</math> for <math>r = \frac{5^{1/2} + 3}{2}</math></p>	<p>B29 How many revolutions does a wheel of radius <math>\frac{3}{2}</math> ft. require to roll <math>24\pi</math> ft. without slipping?</p>	<p>B30 Solve for z:  <math>2x - y - z = 1</math>  <math>-x + 2y - z = 4</math>  <math>-x - y + 3z = 2</math></p>
<p>B31 Simplify</p> $(2^{r-1} + 2^{-r-1})^2 - (2^{r-1} - 2^{-r-1})^2$	<p>B32 A right triangle has hypotenuse of length 5 and perimeter 12. What is its area?</p>	<p>B33 If <math>x^3 - y^3 = 24</math> and <math>x = y + 2</math>, evaluate <math>x^2 + xy + y^2</math>.</p>	<p>B34 What is the sum of the first 2004 positive integers?</p>	<p>B35 <math>y = x^2 + bx + c</math> has vertex (3,5). <math>c = ?</math></p>
<p>B36 How many 6-digit integers have four 5's and two 7's as digits?</p>	<p>B37 Dividing <math>x^4 + bx + 2004</math> by <math>x - 2</math> leaves remainder 20. <math>b = ?</math></p>	<p>B38 How many ordered triples (a,b,c) of positive integers satisfy <math>a + b + c = 6</math>?</p>	<p>B39 Evaluate <math>(4445)^2 - (4444)^2</math></p>	<p>B40 What is the least positive integer n such that <math>1 + 2 + 2^2 + 2^3 + \dots + 2^n</math> is greater than 2004?</p>