Why do people like abstract art?

Frank Thuijsman

f.thuijsman@maastrichtuniversity.nl

TAOP - I Am A Painter, Maastricht, November 1, 2017
Kazimir Malevich (1915): The Black Square
Da Vinci – Vitruvius (1485/1490)
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Golden Ratio

\[
\frac{AB}{AP} = \frac{AP}{PB}
\]
Golden Ratio
Golden Ratio
Golden Ratio – Da Vinci (1475)
Golden Ratio – Botticelli (1485)
Golden Ration – Botticelli (1485)
Golden Ratio – Vermeer (1665)
Golden Ratio – Mondriaan (1920)

[Image: Mondriaan's painting with golden ratio lines drawn on it]
Piet Mondriaan (1920): Composition A
Beyond the Sky
Beyond the Sky
Beyond the Sky
Beyond the Sky
Beyond the Sky
Beyond the Sky
Beyond the Sky
Beyond the Sky
Beyond the Sky
Beyond the Sky
Beyond the Sky
Beyond the Sky
Beyond the Sky
Beyond the Sky
Beyond the Sky
Beyond the Sky
Pythagoras’ Theorem

\[ a^2 + b^2 = c^2 \]
Pythagoras’ Theorem

\[ 3^2 + 4^2 = 5^2 \]

Pythagoras at Chartres Cathedral
Pythagoras’ Theorem

$3^2 + 4^2 = 5^2$

Pythagoras at Chartres Cathedral
Pythagoras and Music

Can the ratios of small numbers give us a perfect musical system?

\[ L_1 = 1/2, \ L_2 = 1/2 : \text{ unison; } \]
\[ L_1 = 1/3, \ L_2 = 2/3 : \text{ octave; } \]
\[ L_1 = 3/5, \ L_2 = 2/5 : \text{ perfect fifth; } \]
\[ L_1 = 4/7, \ L_2 = 3/7 : \text{ perfect fourth} \]

Two intervals that add up to an octave are each other’s inversions: e.g. 3/2 x 4/3 = 2, so a fourth is the inversion of the fifth, etc.
Pythagoras’ Theorem

\[ a^2 + b^2 = c^2 \]
Pythagoras’ Theorem

$$a^2 + b^2 = c^2$$
Pythagoras’ Theorem

\[ a^2 + b^2 = c^2 \]
Pythagoras’ Theorem

\[ a^2 + b^2 = c^2 \]
Pythagoras’ Theorem

\[ a^2 + b^2 = c^2 \]
Pythagoras’ Theorem

\[ a^2 + b^2 = c^2 \]
Pythagoras’ Theorem

\[ a^2 + b^2 = c^2 \]
Seven Bridges of Königsberg (±1730)
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Leonard Euler (1707-1783)
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Leonard Euler (1707-1783)

\[ V - E + F = 2 \]
Leonard Euler (1707-1783)

\[ V - E + F = 2 \]

4
Leonard Euler (1707-1783)

\[ V - E + F = 2 \]

4 - 7
Leonard Euler (1707-1783)

\[ V - E + F = 2 \]

\[ 4 - 7 + 5 \]
Leonard Euler (1707-1783)

\[ V - E + F = 2 \]

\[ 4 - 7 + 5 = 2 \]
Leonard Euler (1707-1783)

\[ V - E + F = 2 \]
Leonard Euler (1707-1783)

\[ V - E + F = 2 \]

\[ 4 - 3 + 1 = 2 \]
Leonard Euler (1707-1783)

\[ V - E + F = 2 \]

\[ 4 - 4 + 2 = 2 \]
Leonard Euler (1707-1783)

\[ V - E + F = 2 \]
\[ 4 - 5 + 3 = 2 \]
Leonard Euler (1707-1783)

\[ V - E + F = 2 \]

\[ 4 - 6 + 4 = 2 \]
Leonard Euler (1707-1783)

\[ V - E + F = 2 \]
\[ 4 - 7 + 5 = 2 \]
Euler and Mondriaan

\[ V - E + F = 2 \]
Euler and Mondriaan

\[ V - E + F = 2 \]

45
Euler and Mondriaan

\[ V - E + F = 2 \]

45 – 71
Euler and Mondriaan

\[ V - E + F = 2 \]

\[ 45 - 71 + 28 \]
Euler and Mondriaan

\[ V - E + F = 2 \]

\[ 45 - 71 + 28 = 2 \]
### Platonic Solids

<table>
<thead>
<tr>
<th>Tetrahedron</th>
<th>Octahedron</th>
<th>Hexahedron</th>
<th>Icosahedron</th>
<th>Dodecahedron</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Four Sided</strong></td>
<td><strong>Eight Sided</strong></td>
<td><strong>Six Sided</strong></td>
<td><strong>Twenty Sided</strong></td>
<td><strong>Twelve Sided</strong></td>
</tr>
<tr>
<td><img src="image1.png" alt="Tetrahedron" /></td>
<td><img src="image2.png" alt="Octahedron" /></td>
<td><img src="image3.png" alt="Hexahedron" /></td>
<td><img src="image4.png" alt="Icosahedron" /></td>
<td><img src="image5.png" alt="Dodecahedron" /></td>
</tr>
<tr>
<td><strong>△ Fire</strong></td>
<td><strong>△ Air</strong></td>
<td><strong>▽ Earth</strong></td>
<td><strong>▽ Water</strong></td>
<td><strong>⊙ Aether</strong></td>
</tr>
<tr>
<td>4 faces</td>
<td>8 faces</td>
<td>6 faces</td>
<td>20 faces</td>
<td>12 faces</td>
</tr>
<tr>
<td>4 points</td>
<td>6 points</td>
<td>8 points</td>
<td>12 points</td>
<td>20 points</td>
</tr>
<tr>
<td>6 edges</td>
<td>12 edges</td>
<td>12 edges</td>
<td>30 edges</td>
<td>30 edges</td>
</tr>
</tbody>
</table>

\[ V - E + F = 2 \]

- Tetrahedron: \[ 4 - 6 + 4 = 2 \]
- Octahedron: \[ 6 - 12 + 8 = 2 \]
- Hexahedron: \[ 8 - 12 + 6 = 2 \]
- Icosahedron: \[ 12 - 30 + 20 = 2 \]
- Dodecahedron: \[ 20 - 30 + 12 = 2 \]
Beautiful Numbers
Beautiful Numbers

\[ \pi = 3.14159... \]
Beautiful Numbers

\[ \pi = 3.14159... \]  half circumference of circle with radius 1
Beautiful Numbers

\[\pi = 3.14159...\] half circumference of circle with radius 1
\[e = 2.71828...\]
Beautiful Numbers

\[\pi = 3.14159...\text{ half circumference of circle with radius 1}\]

\[e = 2.71828...\quad e = 1 + \frac{1}{1} + \frac{1}{2*1} + \frac{1}{3*2*1} + \frac{1}{4*3*2*1} + \cdots\]
Beautiful Numbers

\[ \pi = 3.14159... \quad \text{half circumference of circle with radius 1} \]
\[ e = 2.71828... \quad e = 1 + \frac{1}{1} + \frac{1}{2\times1} + \frac{1}{3\times2\times1} + \frac{1}{4\times3\times2\times1} + \cdots \]
\[ i = ? \]
Beautiful Numbers

$\pi = 3.14159...$  
half circumference of circle with radius 1  

$e = 2.71828...$  
$e = 1 + \frac{1}{1} + \frac{1}{2*1} + \frac{1}{3*2*1} + \frac{1}{4*3*2*1} + \ldots$

$i = ?$  
$i^2 = -1$, $i$ is an imaginary number
Beautiful Numbers

\[\pi = 3.14159... \text{\quad half circumference of circle with radius 1}\]

\[e = 2.71828... \quad e = 1 + \frac{1}{1} + \frac{1}{2\cdot1} + \frac{1}{3\cdot2\cdot1} + \frac{1}{4\cdot3\cdot2\cdot1} + \cdots\]

\[i = ? \quad i^2 = -1, \ i \text{ is an imaginary number}\]

\[e^{\pi i} + 1 = 0\]
Beautiful Numbers

\[ \pi = 3.14159... \quad \text{half circumference of circle with radius 1} \]
\[ e = 2.71828... \quad e = 1 + \frac{1}{1} + \frac{1}{2\cdot1} + \frac{1}{3\cdot2\cdot1} + \frac{1}{4\cdot3\cdot2\cdot1} + \ldots \]
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THANKS
Enjoy the Abstract in Art and Beyond!

\[ e^{\pi i} + 1 = 0 \]

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\[ e^{\pi i} + 1 = 0 \]

THANKS