

Suggestions on a number of arrow and harpoon characters

Kent Karlsson
2007-05-05

1. General category for “old” arrows and harpoons vs. for “new” arrows and harpoons

Newly allocated arrows and harpoons are all of general category Sm. For some reason “older” arrows and harpoons often have general category So. I see no particular reason why those arrows and harpoons should not also have general category Sm. The characters affected are the ones listed below. **I think it would be a bad idea to in any way treat the “old” arrows/harpoons differently (general category-wise) from “new” arrows/harpoons. Hence, I suggest that the characters listed below get general category Sm.**

Dingbats and similar characters (like keyboard symbols) have not been included even when arrow-like. They should stay as So. However,

237C;RIGHT ANGLE WITH DOWNWARDS ZIGZAG ARROW;Sm;0;ON;;;;;N;;;;;

is of g.c. Sm. Perhaps it should have g.c. So. If it should stay Sm, then it should probably have a mirror character (see below).

List of characters:

2195;UP DOWN ARROW;**So**;0;ON;;;;;N;;;;;

2196;NORTH WEST ARROW;**So**;0;ON;;;;;N;UPPER LEFT ARROW;;;;

2197;NORTH EAST ARROW;**So**;0;ON;;;;;N;UPPER RIGHT ARROW;;;;

2198;SOUTH EAST ARROW;**So**;0;ON;;;;;N;LOWER RIGHT ARROW;;;;

2199;SOUTH WEST ARROW;**So**;0;ON;;;;;N;LOWER LEFT ARROW;;;;

219C;LEFTWARDS WAVE ARROW;**So**;0;ON;;;;;N;LEFT WAVE ARROW;;;;

219D;RIGHTWARDS WAVE ARROW;**So**;0;ON;;;;;N;RIGHT WAVE ARROW;;;;

21AD;LEFT RIGHT WAVE ARROW;**So**;0;ON;;;;;N;;;;;

219E;LEFTWARDS TWO HEADED ARROW;**So**;0;ON;;;;;N;LEFT TWO HEADED ARROW;;;;

219F;UPWARDS TWO HEADED ARROW;**So**;0;ON;;;;;N;UP TWO HEADED ARROW;;;;

note that 21A0;RIGHTWARDS TWO HEADED ARROW;Sm;0;ON;;;;;N;RIGHT TWO HEADED ARROW;;;;
 21A1;DOWNWARDS TWO HEADED ARROW;**So**;0;ON;;;;;N;DOWN TWO HEADED ARROW;;;

21A2;LEFTWARDS ARROW WITH TAIL;**So**;0;ON;;;;;N;LEFT ARROW WITH TAIL;;;
 note that 21A3;RIGHTWARDS ARROW WITH TAIL;Sm;0;ON;;;;;N;RIGHT ARROW WITH TAIL;;;;

21A4;LEFTWARDS ARROW FROM BAR;**So**;0;ON;;;;;N;LEFT ARROW FROM BAR;;;
 21A5;UPWARDS ARROW FROM BAR;**So**;0;ON;;;;;N;UP ARROW FROM BAR;;;
 note that 21A6;RIGHTWARDS ARROW FROM BAR;Sm;0;ON;;;;;N;RIGHT ARROW FROM BAR;;;;
 21A7;DOWNWARDS ARROW FROM BAR;**So**;0;ON;;;;;N;DOWN ARROW FROM BAR;;;

21A8;UP DOWN ARROW WITH BASE;**So**;0;ON;;;;;N;;;;

21A9;LEFTWARDS ARROW WITH HOOK;**So**;0;ON;;;;;N;LEFT ARROW WITH HOOK;;;
 21AA;RIGHTWARDS ARROW WITH HOOK;**So**;0;ON;;;;;N;RIGHT ARROW WITH HOOK;;;

21AB;LEFTWARDS ARROW WITH LOOP;**So**;0;ON;;;;;N;LEFT ARROW WITH LOOP;;;
 21AC;RIGHTWARDS ARROW WITH LOOP;**So**;0;ON;;;;;N;RIGHT ARROW WITH LOOP;;;

21B0;UPWARDS ARROW WITH TIP LEFTWARDS;**So**;0;ON;;;;;N;UP ARROW WITH TIP LEFT;;;
 21B1;UPWARDS ARROW WITH TIP RIGHTWARDS;**So**;0;ON;;;;;N;UP ARROW WITH TIP RIGHT;;;
 21B2;DOWNWARDS ARROW WITH TIP LEFTWARDS;**So**;0;ON;;;;;N;DOWN ARROW WITH TIP LEFT;;;
 21B3;DOWNWARDS ARROW WITH TIP RIGHTWARDS;**So**;0;ON;;;;;N;DOWN ARROW WITH TIP RIGHT;;;

21B6;ANTICLOCKWISE TOP SEMICIRCLE ARROW;**So**;0;ON;;;;;N;;;;
 21B7;CLOCKWISE TOP SEMICIRCLE ARROW;**So**;0;ON;;;;;N;;;;

21BA;ANTICLOCKWISE OPEN CIRCLE ARROW;**So**;0;ON;;;;;N;;;;
 21BB;CLOCKWISE OPEN CIRCLE ARROW;**So**;0;ON;;;;;N;;;;

21BC;LEFTWARDS HARPOON WITH BARB UPWARDS;**So**;0;ON;;;;;N;LEFT HARPOON WITH BARB UP;;;
 21BD;LEFTWARDS HARPOON WITH BARB DOWNWARDS;**So**;0;ON;;;;;N;LEFT HARPOON WITH BARB DOWN;;;
 21BE;UPWARDS HARPOON WITH BARB RIGHTWARDS;**So**;0;ON;;;;;N;UP HARPOON WITH BARB RIGHT;;;
 21BF;UPWARDS HARPOON WITH BARB LEFTWARDS;**So**;0;ON;;;;;N;UP HARPOON WITH BARB LEFT;;;
 21C0;RIGHTWARDS HARPOON WITH BARB UPWARDS;**So**;0;ON;;;;;N;RIGHT HARPOON WITH BARB UP;;;
 21C1;RIGHTWARDS HARPOON WITH BARB DOWNWARDS;**So**;0;ON;;;;;N;RIGHT HARPOON WITH BARB DOWN;;;
 21C2;DOWNWARDS HARPOON WITH BARB RIGHTWARDS;**So**;0;ON;;;;;N;DOWN HARPOON WITH BARB RIGHT;;;
 21C3;DOWNWARDS HARPOON WITH BARB LEFTWARDS;**So**;0;ON;;;;;N;DOWN HARPOON WITH BARB LEFT;;;

21CB;LEFTWARDS HARPOON OVER RIGHTWARDS HARPOON;**So**;0;ON;;;;;N;LEFT HARPOON OVER RIGHT HARPOON;;;
 21CC;RIGHTWARDS HARPOON OVER LEFTWARDS HARPOON;**So**;0;ON;;;;;N;RIGHT HARPOON OVER LEFT HARPOON;;;

21C4;RIGHTWARDS ARROW OVER LEFTWARDS ARROW;**So**;0;ON;;;;N;RIGHT ARROW OVER LEFT ARROW;;;
 21C6;LEFTWARDS ARROW OVER RIGHTWARDS ARROW;**So**;0;ON;;;;N;LEFT ARROW OVER RIGHT ARROW;;;

21C5;UPWARDS ARROW LEFTWARDS OF DOWNWARDS ARROW;**So**;0;ON;;;;N;UP ARROW LEFT OF DOWN ARROW;;;
 note that 21F5;DOWNWARDS ARROW LEFTWARDS OF UPWARDS ARROW;Sm;0;ON;;;;N;;;;

21C7;LEFTWARDS PAIRED ARROWS;**So**;0;ON;;;;N;LEFT PAIRED ARROWS;;;
 21C8;UPWARDS PAIRED ARROWS;**So**;0;ON;;;;N;UP PAIRED ARROWS;;;
 21C9;RIGHTWARDS PAIRED ARROWS;**So**;0;ON;;;;N;RIGHT PAIRED ARROWS;;;
 21CA;DOWNWARDS PAIRED ARROWS;**So**;0;ON;;;;N;DOWN PAIRED ARROWS;;;

21D0;LEFTWARDS DOUBLE ARROW;**So**;0;ON;;;;N;LEFT DOUBLE ARROW;;;
 21CD;LEFTWARDS DOUBLE ARROW WITH STROKE;**So**;0;ON;21D0 0338;;;;N;LEFT DOUBLE ARROW WITH STROKE;;;
 21D1;UPWARDS DOUBLE ARROW;**So**;0;ON;;;;N;UP DOUBLE ARROW;;;
 21D2;RIGHTWARDS DOUBLE ARROW;**Sm**;0;ON;;;;N;RIGHT DOUBLE ARROW;;;
 21CF;RIGHTWARDS DOUBLE ARROW WITH STROKE;**Sm**;0;ON;21D2 0338;;;;N;RIGHT DOUBLE ARROW WITH STROKE;;;
 21D3;DOWNWARDS DOUBLE ARROW;**So**;0;ON;;;;N;DOWN DOUBLE ARROW;;;
 21D4;LEFT RIGHT DOUBLE ARROW;**Sm**;0;ON;;;;N;;;;
 21CE;LEFT RIGHT DOUBLE ARROW WITH STROKE;**Sm**;0;ON;21D4 0338;;;;N;;;;
 21D5;UP DOWN DOUBLE ARROW;**So**;0;ON;;;;N;;;;

21D6;NORTH WEST DOUBLE ARROW;**So**;0;ON;;;;N;UPPER LEFT DOUBLE ARROW;;;
 21D7;NORTH EAST DOUBLE ARROW;**So**;0;ON;;;;N;UPPER RIGHT DOUBLE ARROW;;;
 21D8;SOUTH EAST DOUBLE ARROW;**So**;0;ON;;;;N;LOWER RIGHT DOUBLE ARROW;;;
 21D9;SOUTH WEST DOUBLE ARROW;**So**;0;ON;;;;N;LOWER LEFT DOUBLE ARROW;;;

21DA;LEFTWARDS TRIPLE ARROW;**So**;0;ON;;;;N;LEFT TRIPLE ARROW;;;
 21DB;RIGHTWARDS TRIPLE ARROW;**So**;0;ON;;;;N;RIGHT TRIPLE ARROW;;;

21DC;LEFTWARDS SQUIGGLE ARROW;**So**;0;ON;;;;N;LEFT SQUIGGLE ARROW;;;
 21DD;RIGHTWARDS SQUIGGLE ARROW;**So**;0;ON;;;;N;RIGHT SQUIGGLE ARROW;;;

21DE;UPWARDS ARROW WITH DOUBLE STROKE;**So**;0;ON;;;;N;UP ARROW WITH DOUBLE STROKE;;;
 21DF;DOWNWARDS ARROW WITH DOUBLE STROKE;**So**;0;ON;;;;N;DOWN ARROW WITH DOUBLE STROKE;;;

21E0;LEFTWARDS DASHED ARROW;**So**;0;ON;;;;N;LEFT DASHED ARROW;;;
 21E1;UPWARDS DASHED ARROW;**So**;0;ON;;;;N;UP DASHED ARROW;;;
 21E2;RIGHTWARDS DASHED ARROW;**So**;0;ON;;;;N;RIGHT DASHED ARROW;;;
 21E3;DOWNWARDS DASHED ARROW;**So**;0;ON;;;;N;DOWN DASHED ARROW;;;

21E4;LEFTWARDS ARROW TO BAR;**So**;0;ON;;;;N;LEFT ARROW TO BAR;;;
 21E5;RIGHTWARDS ARROW TO BAR;**So**;0;ON;;;;N;RIGHT ARROW TO BAR;;;

21E6;LEFTWARDS WHITE ARROW;So;0;ON;;;;;N;WHITE LEFT ARROW;;;
 21E7;UPWARDS WHITE ARROW;So;0;ON;;;;;N;WHITE UP ARROW;;;
 21E8;RIGHTWARDS WHITE ARROW;So;0;ON;;;;;N;WHITE RIGHT ARROW;;;
 21E9;DOWNWARDS WHITE ARROW;So;0;ON;;;;;N;WHITE DOWN ARROW;;;

21EA;UPWARDS WHITE ARROW FROM BAR;So;0;ON;;;;;N;WHITE UP ARROW FROM BAR;;;

21EB;UPWARDS WHITE ARROW ON PEDESTAL;So;0;ON;;;;;N;
 21EC;UPWARDS WHITE ARROW ON PEDESTAL WITH HORIZONTAL BAR;So;0;ON;;;;;N;
 21ED;UPWARDS WHITE ARROW ON PEDESTAL WITH VERTICAL BAR;So;0;ON;;;;;N;
 21EE;UPWARDS WHITE DOUBLE ARROW;So;0;ON;;;;;N;
 21EF;UPWARDS WHITE DOUBLE ARROW ON PEDESTAL;So;0;ON;;;;;N;

21F0;RIGHTWARDS WHITE ARROW FROM WALL;So;0;ON;;;;;N;

21F1;NORTH WEST ARROW TO CORNER;So;0;ON;;;;;N;
 21F2;SOUTH EAST ARROW TO CORNER;So;0;ON;;;;;N;

21F3;UP DOWN WHITE ARROW;So;0;ON;;;;;N;

2B00;NORTH EAST WHITE ARROW;So;0;ON;;;;;N;
 2B01;NORTH WEST WHITE ARROW;So;0;ON;;;;;N;
 2B02;SOUTH EAST WHITE ARROW;So;0;ON;;;;;N;
 2B03;SOUTH WEST WHITE ARROW;So;0;ON;;;;;N;
 2B04;LEFT RIGHT WHITE ARROW;So;0;ON;;;;;N;

2B05;LEFTWARDS BLACK ARROW;So;0;ON;;;;;N;
 2B06;UPWARDS BLACK ARROW;So;0;ON;;;;;N;
 2B07;DOWNWARDS BLACK ARROW;So;0;ON;;;;;N;
 2B08;NORTH EAST BLACK ARROW;So;0;ON;;;;;N;
 2B09;NORTH WEST BLACK ARROW;So;0;ON;;;;;N;
 2B0A;SOUTH EAST BLACK ARROW;So;0;ON;;;;;N;
 2B0B;SOUTH WEST BLACK ARROW;So;0;ON;;;;;N;
 2B0C;LEFT RIGHT BLACK ARROW;So;0;ON;;;;;N;
 2B0D;UP DOWN BLACK ARROW;So;0;ON;;;;;N;

2B0E;RIGHTWARDS ARROW WITH TIP DOWNWARDS;So;0;ON;;;;;N;
 2B0F;RIGHTWARDS ARROW WITH TIP UPWARDS;So;0;ON;;;;;N;
 2B10;LEFTWARDS ARROW WITH TIP DOWNWARDS;So;0;ON;;;;;N;
 2B11;LEFTWARDS ARROW WITH TIP UPWARDS;So;0;ON;;;;;N;

2. Still missing mirror versions for arrows and harpoons

“P+” here refers to the suggestions made in ISO/IEC JTC1/SC2/WG2 N 3259, and recently accepted.

N 3259 implies that there are only a handful of missing mirrors for arrows (and harpoons), and proposes six characters

However, going through the Sm and should-be-Sm (see above) arrows and harpoons, several of the arrow characters miss a mirror arrow allocated as a character. I found the following arrow Sm (or should-be-Sm) characters that have no mirror character, though some are covered by draft AMD 3 (red hex numbers below). **Those still missing are marked with bold and underline in the list below, which I propose should be encoded (summarised after the list). I would also suggest adding the Sm arrow/harpoon mirror mappings as comment lines to BidiMirroring.txt.**

List of characters:

```
21F0;RIGHTWARDS WHITE ARROW FROM WALL;So;0;ON;;;;N;;;;;  
...LEFTWARDS WHITE ARROW FROM WALL is missing, at least if it is made Sm, maybe otherwise too
```

```
21F1;NORTH WEST ARROW TO CORNER;So;0;ON;;;;N;;;;;  
21F2;SOUTH EAST ARROW TO CORNER;So;0;ON;;;;N;;;;;  
...mirror characters are missing, at least if it is made Sm, maybe otherwise too
```

```
21F4;RIGHT ARROW WITH SMALL CIRCLE;Sm;0;ON;;;;N;;;;;  
...LEFT ARROW WITH SMALL CIRCLE is 2B30
```

```
21F6;THREE RIGHTWARDS ARROWS;Sm;0;ON;;;;N;;;;;  
...THREE LEFTWARDS ARROWS is 2B31
```

```
27F4;RIGHT ARROW WITH CIRCLED PLUS;Sm;0;ON;;;;N;;;;;  
...LEFT ARROW WITH CIRCLED PLUS is 2B32
```

```
27FF;LONG RIGHTWARDS SQUIGGLE ARROW;Sm;0;ON;;;;N;;;;;  
...LONG LEFTWARDS SQUIGGLE ARROW is 2B33
```

```
2900;RIGHTWARDS TWO-HEADED ARROW WITH VERTICAL STROKE;Sm;0;ON;;;;N;;;;;  
2901;RIGHTWARDS TWO-HEADED ARROW WITH DOUBLE VERTICAL STROKE;Sm;0;ON;;;;N;;;;;  
...LEFTWARDS of those two are 2B34 2B35
```

```
2905;RIGHTWARDS TWO-HEADED ARROW FROM BAR;Sm;0;ON;;;;N;;;;;  
...LEFTWARDS of that one is 2B36
```

```
2910;RIGHTWARDS TWO-HEADED TRIPLE DASH ARROW;Sm;0;ON;;;;N;;;;;  
2911;RIGHTWARDS ARROW WITH DOTTED STEM;Sm;0;ON;;;;N;;;;;
```

...LEFTWARDS of those two are **2B37** **2B38**

2914;RIGHTWARDS ARROW WITH TAIL WITH VERTICAL STROKE;Sm;0;ON;;;;N;;;;;
 2915;RIGHTWARDS ARROW WITH TAIL WITH DOUBLE VERTICAL STROKE;Sm;0;ON;;;;N;;;;;
 2916;RIGHTWARDS TWO-HEADED ARROW WITH TAIL;Sm;0;ON;;;;N;;;;;
 2917;RIGHTWARDS TWO-HEADED ARROW WITH TAIL WITH VERTICAL STROKE;Sm;0;ON;;;;N;;;;;
 2918;RIGHTWARDS TWO-HEADED ARROW WITH TAIL WITH DOUBLE VERTICAL STROKE;Sm;0;ON;;;;N;;;;;
 ...LEFTWARDS of those five are **2B39** **2B3A** **2B3B** **2B3C** **2B3D**

292D;SOUTH EAST ARROW CROSSING NORTH EAST ARROW;Sm;0;ON;;;;N;;;;;
 292E;NORTH EAST ARROW CROSSING SOUTH EAST ARROW;Sm;0;ON;;;;N;;;;;
 292F;FALLING DIAGONAL CROSSING NORTH EAST ARROW;Sm;0;ON;;;;N;;;;;
 2930;RISING DIAGONAL CROSSING SOUTH EAST ARROW;Sm;0;ON;;;;N;;;;;
...mirrors of those four are missing

2933;WAVE ARROW POINTING DIRECTLY RIGHT;Sm;0;ON;;;;N;;;;;
 ...LEFT of that one is **2B3F**

2934;ARROW POINTING RIGHTWARDS THEN CURVING UPWARDS;Sm;0;ON;;;;N;;;;;
 2935;ARROW POINTING RIGHTWARDS THEN CURVING DOWNWARDS;Sm;0;ON;;;;N;;;;;
...LEFTWARDS of those two are missing

293A;TOP ARC ANTICLOCKWISE ARROW;Sm;0;ON;;;;N;;;;;
 293B;BOTTOM ARC ANTICLOCKWISE ARROW;Sm;0;ON;;;;N;;;;;
...CLOCKWISE of those two are missing

293C;TOP ARC CLOCKWISE ARROW WITH MINUS;Sm;0;ON;;;;N;;;;;
 293D;TOP ARC ANTICLOCKWISE ARROW WITH PLUS;Sm;0;ON;;;;N;;;;;
...mirrors of those two are missing

2944;SHORT RIGHTWARDS ARROW ABOVE LEFTWARDS ARROW;Sm;0;ON;;;;N;;;;;
...mirror of that one is missing

2947;RIGHTWARDS ARROW THROUGH X;Sm;0;ON;;;;N;;;;;
 ...mirror of that one is **2B3E**

2970;RIGHT DOUBLE ARROW WITH ROUNDED HEAD;Sm;0;ON;;;;N;;;;;
...mirror of that one is missing

2971;EQUALS SIGN ABOVE RIGHTWARDS ARROW;Sm;0;ON;;;;N;;;;;
 ...mirror of that one is **2B40**

2972;TILDE OPERATOR ABOVE RIGHTWARDS ARROW;Sm;0;ON;;;;N;;;;;
 ...REVERSE TILDE OPERATOR ABOVE LEFTWARDS ARROW is **2B41**

P+2B47 REVERSE TILDE OPERATOR ABOVE RIGHTWARDS ARROW, new in N 3259
 P+2B49 TILDE OPERATOR ABOVE LEFTWARDS ARROW, new in N 3259

2973;LEFTWARDS ARROW ABOVE TILDE OPERATOR;Sm;0;ON;;;;N;;;;
P+2B4C RIGHTWARDS ARROW ABOVE REVERSE TILDE OPERATOR * mirror image of 2974; **no, but mirror image of 2973**

2974;RIGHTWARDS ARROW ABOVE TILDE OPERATOR;Sm;0;ON;;;;N;;;;
P+2B4B LEFTWARDS ARROW ABOVE REVERSE TILDE OPERATOR * mirror image of 2973; **no, but mirror image of 2974**

2975;RIGHTWARDS ARROW ABOVE ALMOST EQUAL TO;Sm;0;ON;;;;N;;;;
...LEFTWARDS ARROW ABOVE REVERSE ALMOST EQUAL TO is **2B42**

P+2B48 RIGHTWARDS ARROW ABOVE REVERSE ALMOST EQUAL TO, new in N 3259
P+2B4A LEFTWARDS ARROW ABOVE ALMOST EQUAL TO, new in N 3259

2977;LEFTWARDS ARROW THROUGH LESS-THAN;Sm;0;ON;;;;N;;;;
...mirror of that one is **2B43**

297A;LEFTWARDS ARROW THROUGH SUBSET;Sm;0;ON;;;;N;;;;
...mirror of that one is **2B44**

2B05;LEFTWARDS BLACK ARROW;**So;0;ON;;;;N;;;;**
...mirror of that one is missing, at least if it is made into Sm, maybe otherwise too

Names of the 16 suggested arrow characters for missing mirror versions of existing arrow characters

LEFTWARDS WHITE ARROW FROM WALL	mirror of 21F0
SOUTH WEST ARROW TO CORNER	mirror of 21F1
NORTH EAST ARROW TO CORNER	mirror of 21F2
SOUTH WEST ARROW CROSSING NORTH WEST ARROW	mirror of 292D
NORTH WEST ARROW CROSSING SOUTH WEST ARROW	mirror of 292E
RISING DIAGONAL CROSSING NORTH WEST ARROW	mirror of 292F
FALLING DIAGONAL CROSSING SOUTH WEST ARROW	mirror of 22930
ARROW POINTING LEFTWARDS THEN CURVING UPWARDS	mirror of 2934
ARROW POINTING LEFTWARDS THEN CURVING DOWNWARDS	mirror of 2935
TOP ARC CLOCKWISE ARROW	mirror of 293A
BOTTOM ARC CLOCKWISE ARROW	mirror of 293B
TOP ARC ANTICLOCKWISE ARROW WITH MINUS	mirror of 293C
TOP ARC CLOCKWISE ARROW WITH PLUS	mirror of 293D
SHORT LEFTWARDS ARROW ABOVE RIGHTWARDS ARROW	mirror of 2944
LEFT DOUBLE ARROW WITH ROUNDED HEAD	mirror of 2970
RIGHTWARDS BLACK ARROW	mirror of 2B05

3. Mirroring of 0338 (COMBINING LONG SOLIDUS OVERLAY) and related characters

There is another problem with the math symbols that are negated, using 0338;COMBINING LONG SOLIDUS OVERLAY. This combining character itself is currently not mirrored (though it seems 20E5;COMBINING REVERSE SOLIDUS OVERLAY would be a glyphic mirror).

However, there are precomposed characters with 0338 in their decomposition, some of which are mirrored, some are not.

The following precomposed negated (with 0338) non-automirrored math symbols are allocated:

```
219A;LEFTWARDS ARROW WITH STROKE;Sm;0;ON;2190 0338;;;N;LEFT ARROW WITH STROKE;;;
219B;RIGHTWARDS ARROW WITH STROKE;Sm;0;ON;2192 0338;;;N;RIGHT ARROW WITH STROKE;;;
21AE;LEFT RIGHT ARROW WITH STROKE;Sm;0;ON;2194 0338;;;N;
21CD;LEFTWARDS DOUBLE ARROW WITH STROKE;So;0;ON;21D0 0338;;;N;LEFT DOUBLE ARROW WITH STROKE;;;
21CE;LEFT RIGHT DOUBLE ARROW WITH STROKE;Sm;0;ON;21D4 0338;;;N;
21CF;RIGHTWARDS DOUBLE ARROW WITH STROKE;Sm;0;ON;21D2 0338;;;N;RIGHT DOUBLE ARROW WITH STROKE;;;
226D;NOT EQUIVALENT TO;Sm;0;ON;224D 0338;;;N;

```

The following precomposed negated automirrored **symmetric** (apart from the negation stroke) math symbols are allocated:

```
2224;DOES NOT DIVIDE;Sm;0;ON;2223 0338;;;Y;
2226;NOT PARALLEL TO;Sm;0;ON;2225 0338;;;Y;
2260;NOT EQUAL TO;Sm;0;ON;003D 0338;;;Y;
2262;NOT IDENTICAL TO;Sm;0;ON;2261 0338;;;Y;
2ADC;FORKING;Sm;0;ON;2ADD 0338;;;Y;not independent;

```

The following precomposed negated automirrored **asymmetric** (even when ignoring the negation stroke) math symbols are allocated:

```
2204;THERE DOES NOT EXIST;Sm;0;ON;2203 0338;;;Y;
2209;NOT AN ELEMENT OF;Sm;0;ON;2208 0338;;;Y;
220C;DOES NOT CONTAIN AS MEMBER;Sm;0;ON;220B 0338;;;Y;
2241;NOT TILDE;Sm;0;ON;223C 0338;;;Y;
2244;NOT ASYMPTOTICALLY EQUAL TO;Sm;0;ON;2243 0338;;;Y;
2247;NEITHER APPROXIMATELY NOR ACTUALLY EQUAL TO;Sm;0;ON;2245 0338;;;Y;
2249;NOT ALMOST EQUAL TO;Sm;0;ON;2248 0338;;;Y;
226E;NOT LESS-THAN;Sm;0;ON;003C 0338;;;Y;NOT LESS THAN;
226F;NOT GREATER-THAN;Sm;0;ON;003E 0338;;;Y;NOT GREATER THAN;
2270;NEITHER LESS-THAN NOR EQUAL TO;Sm;0;ON;2264 0338;;;Y;NEITHER LESS THAN NOR EQUAL TO;
2271;NEITHER GREATER-THAN NOR EQUAL TO;Sm;0;ON;2265 0338;;;Y;NEITHER GREATER THAN NOR EQUAL TO;
2274;NEITHER LESS-THAN NOR EQUIVALENT TO;Sm;0;ON;2272 0338;;;Y;NEITHER LESS THAN NOR EQUIVALENT TO;
2275;NEITHER GREATER-THAN NOR EQUIVALENT TO;Sm;0;ON;2273 0338;;;Y;NEITHER GREATER THAN NOR EQUIVALENT TO;
2278;NEITHER LESS-THAN NOR GREATER-THAN;Sm;0;ON;2276 0338;;;Y;NEITHER LESS THAN NOR GREATER THAN;

```


2279;NEITHER GREATER-THAN NOR LESS-THAN;Sm;0;ON;2277 0338;;;Y;NEITHER GREATER THAN NOR LESS THAN;;;
 2280;DOES NOT PRECEDE;Sm;0;ON;227A 0338;;;Y;;;;
 2281;DOES NOT SUCCEED;Sm;0;ON;227B 0338;;;Y;;;;
 2284;NOT A SUBSET OF;Sm;0;ON;2282 0338;;;Y;;;;
 2285;NOT A SUPERSET OF;Sm;0;ON;2283 0338;;;Y;;;;
 2288;NEITHER A SUBSET OF NOR EQUAL TO;Sm;0;ON;2286 0338;;;Y;;;;
 2289;NEITHER A SUPERSET OF NOR EQUAL TO;Sm;0;ON;2287 0338;;;Y;;;;
 22AC;DOES NOT PROVE;Sm;0;ON;22A2 0338;;;Y;;;;
 22AD;NOT TRUE;Sm;0;ON;22A8 0338;;;Y;;;;
 22AE;DOES NOT FORCE;Sm;0;ON;22A9 0338;;;Y;;;;
 22AF;NEGATED DOUBLE VERTICAL BAR DOUBLE RIGHT TURNSTILE;Sm;0;ON;22AB 0338;;;Y;;;;
 22E0;DOES NOT PRECEDE OR EQUAL;Sm;0;ON;227C 0338;;;Y;;;;
 22E1;DOES NOT SUCCEED OR EQUAL;Sm;0;ON;227D 0338;;;Y;;;;
 22E2;NOT SQUARE IMAGE OF OR EQUAL TO;Sm;0;ON;2291 0338;;;Y;;;;
 22E3;NOT SQUARE ORIGINAL OF OR EQUAL TO;Sm;0;ON;2292 0338;;;Y;;;;
 22EA;NOT NORMAL SUBGROUP OF;Sm;0;ON;22B2 0338;;;Y;;;;
 22EB;DOES NOT CONTAIN AS NORMAL SUBGROUP;Sm;0;ON;22B3 0338;;;Y;;;;
 22EC;NOT NORMAL SUBGROUP OF OR EQUAL TO;Sm;0;ON;22B4 0338;;;Y;;;;
 22ED;DOES NOT CONTAIN AS NORMAL SUBGROUP OR EQUAL;Sm;0;ON;22B5 0338;;;Y;;;;

Now, that characters like 2224;DOES NOT DIVIDE are given the mirroring property (characters that look the same when mirrored are otherwise not given that property) seems to imply that the overlaid solidus should also be mirrored. This would in turn imply that the mirror of 219A;LEFTWARDS ARROW WITH STROKE is not 219B;RIGHTWARDS ARROW WITH STROKE, but instead 2192;RIGHTWARDS ARROW, followed by a 20E5;COMBINING REVERSE SOLIDUS OVERLAY.

OPTION A: But if that is the case, then 0338;COMBINING LONG SOLIDUS OVERLAY should also have the property of being automirrored. On the other hand, arrows are not automirrored, so negated arrows aren't either, and then 0338 should not be mirrored either. So the conclusion would be that 0338 inherits its mirroring property from the base character it is applied to. So for this option one would need to introduce the new concept of "inherited" for mirroring of combining characters, at least for 0338.

OPTION B: On the other hand, if 0338 is really supposed to be non-mirroring, then (e.g.) 219A;LEFTWARDS ARROW WITH STROKE and 219B;RIGHTWARDS ARROW WITH STROKE are exact "mirrors" (in this sense), though they are not glyphically exact mirrors (but nor are italic parentheses). But in that case there is no reason to mark 2224;DOES NOT DIVIDE, 2226;NOT PARALLEL TO, 2260;NOT EQUAL TO, 2262;NOT IDENTICAL TO, and 2ADC;FORKING as mirroring (or alternatively mark also symmetric math symbols as mirroring). One would need to note that negated math symbols, the slanted negation stroke itself is not to be mirrored.

I'm not sure which one of these two options coincides best with expectations for math expressions in a bidi context.

4. Missing canonical decompositions for symbols with vertical strokes

There are some precomposed math symbols that should have had canonical decompositions involving one of:

20D2;COMBINING LONG VERTICAL LINE OVERLAY;Mn;1;NSM;;;;;N;NON-SPACING LONG VERTICAL BAR OVERLAY;;;;

(or maybe 20D3;COMBINING SHORT VERTICAL LINE OVERLAY;Mn;1;NSM;;;;;N;NON-SPACING SHORT VERTICAL BAR OVERLAY;;;)

20E6;COMBINING DOUBLE VERTICAL STROKE OVERLAY;Mn;1;NSM;;;;;N;;;;;

Characters with single vertical stroke (20D2 or maybe 20D3):

21F7;LEFTWARDS ARROW WITH VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

21F8;RIGHTWARDS ARROW WITH VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

21F9;LEFT RIGHT ARROW WITH VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

2900;RIGHTWARDS TWO-HEADED ARROW WITH VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

2902;LEFTWARDS DOUBLE ARROW WITH VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

2903;RIGHTWARDS DOUBLE ARROW WITH VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

2904;LEFT RIGHT DOUBLE ARROW WITH VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

2914;RIGHTWARDS ARROW WITH TAIL WITH VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

2917;RIGHTWARDS TWO-HEADED ARROW WITH TAIL WITH VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

Characters with double vertical stroke (206E):

21FA;LEFTWARDS ARROW WITH DOUBLE VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

21FB;RIGHTWARDS ARROW WITH DOUBLE VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

21FC;LEFT RIGHT ARROW WITH DOUBLE VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

2901;RIGHTWARDS TWO-HEADED ARROW WITH DOUBLE VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

2915;RIGHTWARDS ARROW WITH TAIL WITH DOUBLE VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

2918;RIGHTWARDS TWO-HEADED ARROW WITH TAIL WITH DOUBLE VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

2A68;TRIPLE HORIZONTAL BAR WITH DOUBLE VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

Characters with tripe vertical stroke (which is not yet, at least, allocated as a combining character):

2A69;TRIPLE HORIZONTAL BAR WITH TRIPLE VERTICAL STROKE;Sm;0;ON;;;;;N;;;;;

Unfortunately one cannot add these missing (canonical) decompositions now. Since most arrows when given vertical strokes, except as yet triple vertical strokes, must be encoded using 20D2 (or should that be 20D3) or 20E6, **the best course of action is probably to deprecate the precomposed arrows with vertical strokes, as well as 2A68.**