gl_VertexID
gl_InstanceID
gl_Position
gl_PointSize
gl_FragColor gl_FragData gl_FragCoord gl_FrontFacing
gl_FragDepth
gl_PointCoord
gl_DepthRange gl_HelperInvocation gl_NumWorkGroups gl_WorkGroupSize gl WorkGroupID gl LocallnvocationID gl_GlobalInvocationID gl_LocalInvocationIndex
local_size_x
local_size_y
local_size_z
precision
lowp
mediump
highp
atomic_uint
sampler1D
sampler2D
sampler3D
samplerCube
sampler1DShadow
sampler2DShadow
samplerCubeShadow

ES2.0 ES3.0 ES3.1 GL3.2 GL3.3 GL4.0 GL4.1 GL4.2 GL4.3 GL4.4 GL4.5

| X | V | V | V | V | V | V | V | V | V | V |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| X | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | X | X | X | X | X | X | X | X |
| V | V | V | X | X | X | X | X | X | X | X |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| X | X | V | X | X | X | X | X | X | X | V |
| X | X | V | X | X | X | X | X | V | V | V |
| X | X | V | X | X | X | X | X | V | V | V |
| X | X | V | X | X | X | X | X | V | V | V |
| X | X | V | X | X | X | X | X | V | V | V |
| X | X | V | X | X | X | X | X | V | V | V |
| X | X | V | X | X | X | X | X | V | V | V |
| X | X | V | X | X | X | X | X | V | V | V |
| X | X | V | X | X | X | X | X | V | V | V |
| X | X | V | X | X | X | X | X | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| X | X | V | X | X | X | X | V | V | V | V |
| X | X | X | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| X | X | X | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |

sampler1DArray
sampler2DArray
sampler1DArrayShadow
sampler2DArrayShadow
isampler1D
isampler2D
isampler3D
isamplerCube
isampler1DArray
isampler2DArray
usampler1D
usampler2D
usampler3D
usamplerCube
usampler1DArray
usampler2DArray
sampler2DRect
sampler2DRectShadow
isampler2DRect
usampler2DRect
samplerBuffer
isamplerBuffer
usamplerBuffer
sampler2DMS
isampler2DMS
usampler2DMS
sampler2DMSArray
isampler2DMSArray
usampler2DMSArray
samplerCubeArray
samplerCubeArrayShadow
isamplerCubeArray
usamplerCubeArray
image1D

| X | X | X | V | V | V | V | V | V | V | V |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| X | V | V | V | V | V | V | V | V | V | V |
| X | X | X | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | X | X | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | X | X | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | X | X | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | X | X | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | X | X | X | V | V | V | V | V | V | V |
| X | X | X | X | V | V | V | V | V | V | V |
| X | X | X | X | V | V | V | V | V | V | V |
| X | X | X | X | V | V | V | V | V | V | V |
| X | X | X | V | V | V | V | V | V | V | V |
| X | X | X | V | V | V | V | V | V | V | V |
| X | X | X | V | V | V | V | V | V | V | V |
| X | X | V | V | V | V | V | V | V | V | V |
| X | X | V | V | V | V | V | V | V | V | V |
| X | X | V | V | V | V | V | V | V | V | V |
| X | X | V | V | V | V | V | V | V | V | V |
| X | X | V | V | V | V | V | V | V | V | V |
| X | X | V | V | V | V | V | V | V | V | V |
| X | X | X | X | X | V | V | V | V | V | V |
| X | X | X | X | X | V | V | V | V | V | V |
| X | X | X | X | X | V | V | V | V | V | V |
| X | X | X | X | X | V | V | V | V | V | V |
| X | X | X | X | X | X | X | V | V | V | V |


| iimage1D | x | x | X | X | x | x | $x$ | V | V | V | V |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| uimage1D | X | X | X | X | X | X | X | V | V | v | V |
| image2D | X | X | V | X | X | X | X | V | V | V | V |
| iimage2D | X | X | V | X | x | x | X | V | V | V | v |
| uimage 2D | X | X | V | X | X | X | X | V | V | v | V |
| image3D | X | X | V | X | X | X | X | V | V | v | V |
| iimage3D | X | X | V | x | X | X | x | V | V | V | V |
| uimage3D | X | X | V | X | X | X | X | V | V | V | V |
| image2DRect | X | X | X | X | X | X | X | V | V | v | V |
| iimage2DRect | X | X | X | X | X | X | X | V | V | v | V |
| uimage2DRect | X | X | X | X | X | x | x | V | V | v | V |
| imageCube | X | X | V | X | X | X | X | V | V | V | V |
| iimageCube | X | X | V | X | x | x | X | V | V | V | v |
| uimageCube | X | X | V | X | X | X | X | V | V | V | V |
| imageBuffer | X | X | X | X | x | x | x | V | v | v | v |
| iimageBuffer | X | x | X | X | X | X | X | V | V | V | V |
| uimageBuffer | X | X | X | X | x | x | X | V | V | v | v |
| image1DArray | X | X | X | X | X | x | x | V | V | V | V |
| iimage1DArray | X | X | X | X | x | x | X | V | v | v | v |
| uimage1DArray | X | X | X | X | X | X | X | V | V | v | V |
| image2DArray | X | X | v | X | x | X | X | V | V | v | V |
| iimage2DArray | X | x | V | X | X | x | X | V | V | V | V |
| uimage2DArray | X | X | V | X | X | X | X | V | V | V | V |
| imageCubeArray | X | X | V | X | X | X | X | V | V | V | V |
| iimageCubeArray | X | X | V | X | X | X | X | V | V | v | V |
| uimageCubeArray | x | x | V | x | x | x | x | V | v | V | V |
| image2DMS | X | X | V | X | X | X | X | V | V | V | V |
| iimage2DMS | X | x | V | X | X | x | X | V | V | V | V |
| uimage2DMS | X | X | V | X | X | X | X | V | V | V | V |
| image2DMSArray | X | X | X | X | X | x | X | V | v | v | v |
| iimage2DMSArray | X | X | X | X | X | X | X | V | V | V | V |
| uimage2DMSArray | X | X | X | X | X | X | X | V | V | V | V |
| ivec* | V | v | V | V | V | V | v | V | V | V | V |
| uvec* | X | v | V | V | v | V | v | v | v | v | V |

matN*M
d[vec/mat]*
centroid
smooth
flat
early_fragment_tests vertex input location fragment output location xfb qualifiers
uniform location
varying location storage binding image binding atomic buffer binding / offset
uniform binding
sampler binding
shared
packed
std140
std430
row_major
column_major
Image format rgba32f
Image format rgba16f
Image format rg32f
Image format rg16f
Image format r11f_g11f_b10f
Image format r32f
Image format r16f
Image format rgba16
Image format rgb10_a2
Image format rgba8
Image format rg16
Image format rg8

| $X$ | V | V | V | V | V | V | V | V | V | V |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| X | X | X | X | X | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | X | V | X | X | X | X | V | V | V | V |
| X | V | V | X | V | V | V | V | V | V | V |
| X | V | V | X | V | V | V | V | V | V | V |
| X | X | X | X | X | X | X | X | V | V | V |
| X | X | V | X | X | X | X | X | X | V | V |
| X | X | V | X | X | X | X | V | V | V | V |
| X | X | V | X | X | X | X | X | V | V | V |
| X | X | V | X | X | X | X | V | V | V | V |
| X | X | X | X | X | X | X | V | V | V | V |
| X | X | V | X | X | X | X | V | V | V | V |
| X | X | V | X | X | X | X | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | X | V | X | X | X | X | X | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| X | X | V | X | X | X | X | V | V | V | V |
| X | X | V | X | X | X | X | V | V | V | V |
| X | X | X | X | X | X | X | V | V | V | V |
| X | X | X | X | X | X | X | V | V | V | V |
| X | X | X | X | X | X | X | V | V | V | V |
| X | X | V | X | X | X | X | V | V | V | V |
| X | X | X | X | X | X | X | V | V | V | V |
| X | X | X | X | X | X | X | V | V | V | V |
| X | X | X | X | X | X | X | V | V | V | V |
| X | X | V | X | X | X | X | V | V | V | V |
| X | X | X | X | X | X | X | V | V | V | V |
| X | X | X | X | X | X | X | V | V | V | V |

Image format r16
Image format r8
Image format rgba16_snorm
Image format rgba8_snorm
Image format rg16_snorm
Image format rg8_snorm
Image format r16_snorm
Image format r8_snorm
Image format rgba32i
Image format rgba16i
Image format rgba8i
Image format rg32i
Image format rg16irg8ir32ir16ir8i
Image format rg16i
Image format rg8i
Image format r32i
Image format r16i
Image format r8i
Image format rgba32ui
Image format rgba16ui
Image format rgb10_a2ui
Image format rgba8ui
Image format rg32ui
Image format rg16ui
Image format rg8ui
Image format r32ui
Image format r16ui
Image format r8ui
coherent
volatile
restrict
readonly
writeonly
Trigonometry functions

| x | x | x | x | X | x | X | V | V | V | V |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| X | X | X | X | X | x | X | V | V | V | V |
| x | X | X | x | X | x | X | V | V | v | V |
| X | X | v | X | X | X | X | V | V | v | v |
| x | X | X | x | X | x | X | V | V | V | v |
| X | X | X | X | X | X | X | V | V | V | V |
| X | X | X | X | X | X | X | v | V | v | V |
| X | X | X | X | X | X | X | V | V | V | v |
| X | X | v | x | X | x | X | V | V | V | v |
| x | X | V | x | x | x | x | V | V | v | v |
| X | X | v | X | X | x | X | V | V | V | v |
| X | X | X | X | X | X | X | V | V | V | V |
| X | X | X | X | X | x | X | V | V | V | v |
| x | X | x | x | x | x | x | V | V | v | v |
| X | X | X | X | X | x | X | v | V | v | v |
| X | X | v | X | X | X | X | V | V | V | V |
| X | X | X | X | X | X | X | V | V | v | V |
| X | X | X | x | X | x | X | V | V | v | v |
| X | X | V | X | X | X | X | V | V | v | V |
| X | X | v | x | X | x | X | V | V | v | v |
| X | X | X | X | X | X | X | V | V | v | V |
| X | X | v | X | X | x | X | v | V | V | V |
| X | X | X | X | X | X | X | V | V | V | V |
| X | X | X | x | X | x | X | v | V | v | v |
| x | x | X | x | x | x | x | V | V | v | v |
| X | X | v | x | X | X | X | v | V | v | V |
| X | X | X | X | X | X | X | V | V | V | V |
| X | x | X | X | X | X | X | v | V | v | V |
| x | x | V | x | X | x | X | V | V | v | V |
| X | X | V | X | X | X | X | V | V | v | V |
| x | x | V | x | X | x | X | v | V | v | V |
| X | X | V | X | X | X | X | V | V | V | V |
| X | X | V | X | X | X | X | V | V | V | V |
| V | V | V | v | V | v | v | V | V | V | V |

Hyperbolic functions
Exponential functions
abs
sign
floor
trunc
round
roundEven
ceil
fract
mod
modf
min
max
clamp
mix
mix bool
step
smoothstep
isnan
isinf
floatBitsTo[U]Int [u]intBitsToFloat
fma
frexp
Idexp
[un]packUnorm2x16 [un]packSnorm $2 \times 16$ [un]packUnorm4x8 [un]packSnorm4x8 [un]packDouble2x32 [un]packHalf2x16
Geometric functions matrixCompMult

| V | V | V | V | V | V | V | V | V | V | V |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | X | V | V | V | V | V | V | V |
| X | V | V | X | V | V | V | V | V | V | V |
| X | X | X | X | X | V | V | V | V | V | V |
| X | X | V | X | X | V | V | V | V | V | V |
| X | X | V | X | X | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | X | X | X | X | V | V | V | V |
| X | X | V | V | V | V | V | V | V | V | V |
| X | X | V | V | V | V | V | V | V | V | V |
| X | X | X | X | X | V | V | V | V | V | V |
| X | V | V | X | X | X | X | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | V | V | V | V | V | V | V | V | V |

outerProduct
transpose
determinant
inverse
Vector relational functions
Integer functions
texture
textureSize
textureQueryLod
textureQueryLevels
textureSamples
textureProj
textureLod
textureProjLod
textureCube
textureCubeLod
textureOffset
texelFetch
texelFetchOffset
textureProjOffset
textureLodOffset
textureProjLodOffset
textureGrad
textureGradOffset
textureProjGrad
textureProjGradOffset
textureGather
textureGatherOffset
atomicCounter
Atomic memory functions
imageSize
imageSamples
imageLoad
imageStore

| x | V | V | V | V | V | V | V | V | V | V |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| X | V | V | V | V | V | V | V | V | V | V |
| x | V | v | V | v | v | V | v | V | v | v |
| X | V | V | V | V | V | V | V | V | V | V |
| v | v | V | v | v | V | V | V | V | V | V |
| X | X | v | X | X | V | V | V | V | v | V |
| V | V | V | V | V | V | V | V | V | V | V |
| X | v | v | V | v | V | V | V | V | v | V |
| X | X | X | X | X | v | v | v | V | v | V |
| X | X | X | X | X | X | X | X | V | v | V |
| X | X | X | X | X | X | X | X | X | X | v |
| V | v | v | V | v | v | V | V | V | v | V |
| V | V | V | V | V | V | V | V | V | V | V |
| V | V | v | V | V | V | V | V | V | V | V |
| V | V | v | V | v | V | V | V | V | V | v |
| V | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| x | v | v | v | v | V | V | v | V | v | v |
| x | V | v | V | V | V | V | V | V | V | v |
| X | V | v | V | v | v | V | v | V | v | v |
| X | V | V | V | v | V | V | V | V | v | v |
| X | V | v | V | v | V | V | v | V | V | V |
| X | V | V | V | V | V | V | V | V | V | V |
| X | v | v | V | v | V | V | V | V | V | v |
| x | X | X | X | X | V | V | V | V | V | v |
| X | X | X | X | X | V | V | V | V | V | V |
| X | X | v | X | X | X | X | X | V | v | V |
| X | X | V | X | X | X | X | X | V | V | v |
| X | X | $v$ | X | x | x | X | X | V | v | v |
| x | X | X | x | x | X | X | X | X | X | v |
| x | X | v | X | X | x | X | v | V | v | V |
| X | X | V | X | X | X | X | V | V | V | V |

imageAtomic*
dFdx/y - fwidth
$\mathrm{dFdx} / \mathrm{y}$ - fwidth fine and coarse
interpolate*
Geometry shader functions
barrier
memoryBarrier*

| x | X | X | X | X | X | X | V | V | V | V |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| x | v | v | v | v | v | v | v | v | v | v |
| x | X | X | X | X | X | X | X | X | X | V |
| x | X | X | v | V | v | v | v | v | V | v |
| x | X | X | v | V | v | V | V | V | V | v |
| X | X | v | X | X | X | v | V | V | V | v |
| X | X | v | X | X | X | X | v | v | V | v |

