

1. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=0$ ,  $r=-1$ ,  $l=-3$ ,  $n=-2$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
2. Given a camera position of  $[3 \ 3 \ 4]$ , a gaze vector of  $[2 \ -1 \ 0]$ , and an up vector of  $[-4 \ 3 \ 0]$ , what is the resulting camera transformation matrix?
3. The viewport transformation transforms 2d space into \_\_\_\_\_ space.
4. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
5. The \_\_\_\_\_ transformation transforms object coordinates into world coordinates.
6. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
7. Project point  $[-4 \ -1 \ -3 \ 1]$  onto the plane  $n=4$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
8. Project point  $[2 \ -5 \ 0 \ 1]$  onto the plane  $n=-5$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
9. Perspective division transforms \_\_\_\_\_ space into 2d space.
10. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
11. The view transformation transforms world space into \_\_\_\_\_ space.
12. Create a matrix to transform a parallelepiped defined by  $t=3$ ,  $b=1$ ,  $r=2$ ,  $l=-4$ ,  $n=1$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).
13. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=3$ ,  $r=2$ ,  $l=-4$ ,  $n=-5$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
14. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=0$ ,  $r=4$ ,  $l=2$ ,  $n=0$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).
15. Given a camera position of  $[2 \ 0 \ -5]$ , a gaze vector of  $[2 \ 1 \ -5]$ , and an up vector of  $[2 \ 0 \ 4]$ , what is the resulting camera transformation matrix?
16. Project point  $[0 \ 4 \ -2 \ 1]$  onto the plane  $n=3$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
17. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.

18. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=2$ ,  $r=1$ ,  $l=2$ ,  $n=-4$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
19. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
20. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=2$ ,  $r=-1$ ,  $l=-5$ ,  $n=3$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
21. The viewport transformation transforms \_\_\_\_\_ coordinates into screen coordinates.
22. The \_\_\_\_\_ transformation transforms eye space into clip space.
23. Given a camera position of  $[0 \ -5 \ -4]$ , a gaze vector of  $[0 \ -5 \ -3]$ , and an up vector of  $[-4 \ -5 \ -5]$ , what is the resulting camera transformation matrix?
24. The \_\_\_\_\_ transformation transforms \_\_\_\_\_ coordinates into world coordinates.
25. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
26. The \_\_\_\_\_ transformation transforms 2d space into screen space.
27. Given a camera position of  $[-1 \ 0 \ -5]$ , a gaze vector of  $[-1 \ -4 \ 0]$ , and an up vector of  $[0 \ 1 \ 4]$ , what is the resulting camera transformation matrix?
28. The projection transformation transforms eye space into \_\_\_\_\_ space.
29. Given a camera position of  $[-1 \ -1 \ -1]$ , a gaze vector of  $[-4 \ -3 \ 3]$ , and an up vector of  $[3 \ -4 \ -3]$ , what is the resulting camera transformation matrix?
30. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=-2$ ,  $r=-5$ ,  $l=1$ ,  $n=0$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
31. Project point  $[0 \ 2 \ 0 \ 1]$  onto the plane  $n=-2$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
32. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
33. The \_\_\_\_\_ transformation transforms 2d coordinates into screen coordinates.
34. Given a camera position of  $[-2 \ -4 \ 2]$ , a gaze vector of  $[4 \ -3 \ 2]$ , and an up vector of  $[0 \ 0 \ 4]$ , what is the resulting camera transformation matrix?
35. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-2$ ,  $r=4$ ,  $l=-4$ ,  $n=-2$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
36. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=-2$ ,  $r=2$ ,  $l=-5$ ,  $n=-1$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
37. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=0$ ,  $r=2$ ,  $l=-1$ ,  $n=4$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).

38. The viewport transformation transforms \_\_\_\_\_ coordinates into screen coordinates.
39. Project point  $[-2 \ 4 \ 4 \ 1]$  onto the plane  $n=2$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
40. The projection transformation transforms \_\_\_\_\_ space into the canonical view volume.
41. The \_\_\_\_\_ transformation transforms \_\_\_\_\_ space into world space.
42. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-5$ ,  $r=1$ ,  $l=-3$ ,  $n=4$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
43. Project point  $[-1 \ -2 \ -2 \ 1]$  onto the plane  $n=-2$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
44. Project point  $[-4 \ -1 \ 0 \ 1]$  onto the plane  $n=-3$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
45. Given a camera position of  $[-1 \ -2 \ 2]$ , a gaze vector of  $[2 \ -1 \ 2]$ , and an up vector of  $[2 \ 1 \ -3]$ , what is the resulting camera transformation matrix?
46. The \_\_\_\_\_ transformation transforms clip space into 2d space.
47. Project point  $[-2 \ 1 \ -5 \ 1]$  onto the plane  $n=3$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
48. The viewport transformation transforms 2d coordinates into \_\_\_\_\_ coordinates.
49. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
50. The \_\_\_\_\_ transformation transforms clip space into 2d space.
51. The \_\_\_\_\_ transformation transforms world coordinates into camera coordinates.
52. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
53. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=-2$ ,  $r=3$ ,  $l=2$ ,  $n=2$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
54. Perspective division transforms clip coordinates into \_\_\_\_\_ coordinates.
55. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=-5$ ,  $r=3$ ,  $l=0$ ,  $n=0$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).

56. Project point  $[1 -4 1 1]$  onto the plane  $n=1$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
57. The projection transformation transforms \_\_\_\_\_ space into the canonical view volume.
58. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=2$ ,  $r=2$ ,  $l=-2$ ,  $n=-2$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
59. The \_\_\_\_\_ transformation transforms the canonical view volume into 2d space.
60. Project point  $[4 0 -4 1]$  onto the plane  $n=4$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
61. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
62. Given a camera position of  $[2 3 4]$ , a gaze vector of  $[4 -4 -2]$ , and an up vector of  $[4 -4 3]$ , what is the resulting camera transformation matrix?
63. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
64. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=-1$ ,  $r=4$ ,  $l=3$ ,  $n=-2$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
65. Perspective division transforms \_\_\_\_\_ space into 2d space.
66. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-4$ ,  $r=-2$ ,  $l=-5$ ,  $n=-4$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
67. Project point  $[0 3 -2 1]$  onto the plane  $n=-4$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
68. Project point  $[0 1 -5 1]$  onto the plane  $n=2$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
69. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=-3$ ,  $r=-2$ ,  $l=-1$ ,  $n=4$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
70. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
71. The \_\_\_\_\_ transformation transforms world coordinates into camera coordinates.
72. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=-1$ ,  $r=-1$ ,  $l=4$ ,  $n=-5$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).

73. The projection transformation transforms \_\_\_\_\_ coordinates into the canonical view volume.
74. Project point  $[1 -4 0 1]$  onto the plane  $n=-5$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
75. Project point  $[3 -4 4 1]$  onto the plane  $n=-1$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
76. Given a camera position of  $[-1 -1 -3]$ , a gaze vector of  $[-5 1 3]$ , and an up vector of  $[0 2 -3]$ , what is the resulting camera transformation matrix?
77. Project point  $[4 1 -4 1]$  onto the plane  $n=-2$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
78. Given a camera position of  $[1 1 -2]$ , a gaze vector of  $[-3 0 -5]$ , and an up vector of  $[1 -1 -1]$ , what is the resulting camera transformation matrix?
79. Project point  $[4 -5 4 1]$  onto the plane  $n=4$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
80. Create a matrix to transform a parallelepiped defined by  $t=3$ ,  $b=-2$ ,  $r=-4$ ,  $l=-2$ ,  $n=2$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
81. Project point  $[4 -5 -3 1]$  onto the plane  $n=1$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
82. Project point  $[-4 -1 -5 1]$  onto the plane  $n=-5$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
83. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=-3$ ,  $r=-4$ ,  $l=-5$ ,  $n=4$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
84. Given a camera position of  $[-4 -2 1]$ , a gaze vector of  $[4 1 1]$ , and an up vector of  $[2 1 -3]$ , what is the resulting camera transformation matrix?
85. The view transformation transforms world space into \_\_\_\_\_ space.
86. Given a camera position of  $[-5 4 -1]$ , a gaze vector of  $[0 -1 4]$ , and an up vector of  $[-5 1 -2]$ , what is the resulting camera transformation matrix?

87. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
88. Given a camera position of  $[0 -1 4]$ , a gaze vector of  $[4 3 3]$ , and an up vector of  $[3 4 -1]$ , what is the resulting camera transformation matrix?
89. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
90. The ----- transformation transforms ----- space into world space.
91. Project point  $[-1 0 -4 1]$  onto the plane  $n=-4$ .
  - a) What will  $px, py, pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px, py$  be after perspective division?
92. Project point  $[-4 -4 -1 1]$  onto the plane  $n=-2$ .
  - a) What will  $px, py, pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px, py$  be after perspective division?
93. Project point  $[2 1 -5 1]$  onto the plane  $n=-3$ .
  - a) What will  $px, py, pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px, py$  be after perspective division?
94. Project point  $[4 -2 -1 1]$  onto the plane  $n=-4$ .
  - a) What will  $px, py, pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px, py$  be after perspective division?
95. Given a camera position of  $[0 -4 -4]$ , a gaze vector of  $[-5 -2 -4]$ , and an up vector of  $[-2 -4 4]$ , what is the resulting camera transformation matrix?
96. Given a camera position of  $[0 -1 4]$ , a gaze vector of  $[-5 -5 -1]$ , and an up vector of  $[3 4 0]$ , what is the resulting camera transformation matrix?
97. Project point  $[4 0 0 1]$  onto the plane  $n=1$ .
  - a) What will  $px, py, pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px, py$  be after perspective division?
98. Given a camera position of  $[3 -3 -3]$ , a gaze vector of  $[-3 -4 2]$ , and an up vector of  $[2 -5 -5]$ , what is the resulting camera transformation matrix?
99. Project point  $[-3 0 2 1]$  onto the plane  $n=1$ .
  - a) What will  $px, py, pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px, py$  be after perspective division?
100. Given a camera position of  $[3 -4 -2]$ , a gaze vector of  $[2 -1 -3]$ , and an up vector of  $[-2 -5 3]$ , what is the resulting camera transformation matrix?

101. Project point  $[4 -4 0 1]$  onto the plane  $n=3$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
102. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
103. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
104. Project point  $[3 -2 -3 1]$  onto the plane  $n=-2$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
105. The projection transformation transforms camera space into \_\_\_\_\_ space.
106. Project point  $[-1 -2 -5 1]$  onto the plane  $n=-5$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
107. The \_\_\_\_\_ transformation transforms world space into \_\_\_\_\_ space.
108. Project point  $[4 1 2 1]$  onto the plane  $n=1$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
109. Perspective division transforms \_\_\_\_\_ coordinates into 2d coordinates.
110. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=3$ ,  $r=-1$ ,  $l=3$ ,  $n=0$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).
111. Given a camera position of  $[-5 4 1]$ , a gaze vector of  $[-1 -1 -2]$ , and an up vector of  $[-2 0 4]$ , what is the resulting camera transformation matrix?
112. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
113. The viewport transformation transforms 2d coordinates into \_\_\_\_\_ coordinates.
114. Given a camera position of  $[0 -2 2]$ , a gaze vector of  $[-3 -3 -1]$ , and an up vector of  $[-2 -2 -3]$ , what is the resulting camera transformation matrix?
115. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=1$ ,  $r=4$ ,  $l=-2$ ,  $n=-4$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).
116. Given a camera position of  $[-2 3 -5]$ , a gaze vector of  $[-4 0 -4]$ , and an up vector of  $[-1 3 -3]$ , what is the resulting camera transformation matrix?
117. Given a camera position of  $[-4 1 -5]$ , a gaze vector of  $[-2 4 3]$ , and an up vector of  $[0 3 -5]$ , what is the resulting camera transformation matrix?

118. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
119. Given a camera position of [3 3 3], a gaze vector of [-1 0 4], and an up vector of [-1 -4 -3], what is the resulting camera transformation matrix?
120. Given a camera position of [-1 3 4], a gaze vector of [ 1 3 -2], and an up vector of [-5 4 0], what is the resulting camera transformation matrix?
121. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
122. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
123. Perspective division transforms \_\_\_\_\_ space into 2d space.
124. Given a camera position of [-5 -2 -1], a gaze vector of [ 4 -3 -2], and an up vector of [-1 3 -3], what is the resulting camera transformation matrix?
125. The model transformation transforms model coordinates into \_\_\_\_\_ coordinates.
126. The \_\_\_\_\_ transformation transforms \_\_\_\_\_ coordinates into world coordinates.
127. Create a matrix to transform a parallelepiped defined by t=-4, b=-2, r=-4, l=-3, n=4, and f=3 into the canonical view volume (an orthographic projection matrix).
128. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
129. Create a matrix to transform a parallelepiped defined by t=-4, b=-1, r=2, l=-3, n=5, and f=4 into the canonical view volume (an orthographic projection matrix).
130. Project point [ 3 -4 -4 1] onto the plane n=2.
  - a) What will px, py, pw be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will px, py be after perspective division?
131. Create a matrix to transform a parallelepiped defined by t=4, b=-1, r=2, l=0, n=-1, and f=-5 into the canonical view volume (an orthographic projection matrix).
132. Given a camera position of [-1 2 -2], a gaze vector of [-3 1 -1], and an up vector of [ 4 3 -4], what is the resulting camera transformation matrix?
133. Create a matrix to transform a parallelepiped defined by t=1, b=-1, r=3, l=-3, n=0, and f=1 into the canonical view volume (an orthographic projection matrix).
134. Create a matrix to transform a parallelepiped defined by t=4, b=-5, r=-3, l=-1, n=2, and f=-2 into the canonical view volume (an orthographic projection matrix).
135. Create a matrix to transform a parallelepiped defined by t=2, b=-5, r=-1, l=-2, n=-1, and f=-3 into the canonical view volume (an orthographic projection matrix).
136. The \_\_\_\_\_ transformation transforms camera space into clip space.



137. The viewport transformation transforms 2d space into \_\_\_\_\_ space.
138. Project point  $[-2 \ 3 \ -4 \ 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
139. Given a camera position of  $[4 \ -5 \ 3]$ , a gaze vector of  $[-2 \ -2 \ -5]$ , and an up vector of  $[-5 \ 4 \ -5]$ , what is the resulting camera transformation matrix?
140. The viewport transformation transforms \_\_\_\_\_ space into screen space.
141. Project point  $[-2 \ 2 \ 0 \ 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
142. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
143. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
144. Given a camera position of  $[-5 \ 0 \ 4]$ , a gaze vector of  $[3 \ 3 \ 0]$ , and an up vector of  $[3 \ 1 \ -5]$ , what is the resulting camera transformation matrix?
145. Given a camera position of  $[3 \ 0 \ 2]$ , a gaze vector of  $[1 \ -4 \ -5]$ , and an up vector of  $[-1 \ 4 \ 3]$ , what is the resulting camera transformation matrix?
146. Project point  $[4 \ -5 \ 2 \ 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
147. Given a camera position of  $[0 \ 3 \ -2]$ , a gaze vector of  $[-5 \ 0 \ -2]$ , and an up vector of  $[-1 \ 3 \ 2]$ , what is the resulting camera transformation matrix?
148. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
149. The \_\_\_\_\_ transformation transforms world space into \_\_\_\_\_ space.
150. Project point  $[-2 \ -4 \ 1 \ 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
151. The camera transformation transforms world coordinates into \_\_\_\_\_ coordinates.
152. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=3$ ,  $r=1$ ,  $l=3$ ,  $n=3$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).

153. Project point  $[4 -2 -3 1]$  onto the plane  $n=-3$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
154. Given a camera position of  $[1 -4 3]$ , a gaze vector of  $[3 -4 1]$ , and an up vector of  $[1 -1 4]$ , what is the resulting camera transformation matrix?
155. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
156. The \_\_\_\_\_ transformation transforms 2d coordinates into screen coordinates.
157. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
158. Given a camera position of  $[-2 2 1]$ , a gaze vector of  $[1 -3 -1]$ , and an up vector of  $[2 -4 2]$ , what is the resulting camera transformation matrix?
159. The projection transformation transforms eye coordinates into \_\_\_\_\_ coordinates.
160. Given a camera position of  $[-2 -2 -3]$ , a gaze vector of  $[3 3 1]$ , and an up vector of  $[-1 3 2]$ , what is the resulting camera transformation matrix?
161. Project point  $[1 1 -1 1]$  onto the plane  $n=-5$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
162. Given a camera position of  $[3 3 -2]$ , a gaze vector of  $[2 -2 3]$ , and an up vector of  $[-3 -4 2]$ , what is the resulting camera transformation matrix?
163. Project point  $[-1 -3 -4 1]$  onto the plane  $n=-1$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
164. Project point  $[4 4 3 1]$  onto the plane  $n=1$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
165. The \_\_\_\_\_ transformation transforms world coordinates into \_\_\_\_\_ coordinates.
166. Perspective division transforms the canonical view volume into \_\_\_\_\_ space.
167. The \_\_\_\_\_ transformation transforms 2d space into screen space.
168. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
169. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.

170. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=-3$ ,  $r=1$ ,  $l=2$ ,  $n=1$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
171. The projection transformation transforms camera space into \_\_\_\_\_ space.
172. Project point  $[4 -1 0 1]$  onto the plane  $n=2$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
173. The \_\_\_\_\_ transformation transforms world coordinates into camera coordinates.
174. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-1$ ,  $r=-2$ ,  $l=1$ ,  $n=-2$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
175. Project point  $[1 -3 3 1]$  onto the plane  $n=3$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
176. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
177. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
178. Given a camera position of  $[2 -5 0]$ , a gaze vector of  $[-5 -4 3]$ , and an up vector of  $[1 -2 1]$ , what is the resulting camera transformation matrix?
179. Given a camera position of  $[4 0 4]$ , a gaze vector of  $[4 3 -5]$ , and an up vector of  $[1 -1 -4]$ , what is the resulting camera transformation matrix?
180. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=-3$ ,  $r=4$ ,  $l=1$ ,  $n=-2$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
181. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=-2$ ,  $r=-5$ ,  $l=0$ ,  $n=0$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).
182. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=-5$ ,  $r=-3$ ,  $l=-4$ ,  $n=-5$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
183. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=3$ ,  $r=1$ ,  $l=-3$ ,  $n=-2$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
184. Given a camera position of  $[2 0 -2]$ , a gaze vector of  $[-3 4 -4]$ , and an up vector of  $[4 -2 -1]$ , what is the resulting camera transformation matrix?
185. Project point  $[4 -1 1 1]$  onto the plane  $n=1$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?

186. Project point  $[3\ 1\ -3\ 1]$  onto the plane  $n=2$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
187. Given a camera position of  $[-2\ 1\ -4]$ , a gaze vector of  $[-2\ -5\ 4]$ , and an up vector of  $[-2\ -5\ 3]$ , what is the resulting camera transformation matrix?
188. The \_\_\_\_\_ transformation transforms world space into camera space.
189. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=-2$ ,  $r=4$ ,  $l=2$ ,  $n=-4$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
190. The projection transformation transforms \_\_\_\_\_ coordinates into clip coordinates.
191. Given a camera position of  $[-5\ -1\ 3]$ , a gaze vector of  $[4\ -5\ -1]$ , and an up vector of  $[-3\ 0\ -3]$ , what is the resulting camera transformation matrix?
192. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
193. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=1$ ,  $r=2$ ,  $l=-5$ ,  $n=0$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
194. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
195. Given a camera position of  $[3\ -4\ -4]$ , a gaze vector of  $[-4\ -5\ -4]$ , and an up vector of  $[-2\ -2\ 4]$ , what is the resulting camera transformation matrix?
196. Project point  $[-4\ -3\ 1\ 1]$  onto the plane  $n=-2$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
197. Given a camera position of  $[1\ -3\ 1]$ , a gaze vector of  $[-3\ -4\ -3]$ , and an up vector of  $[-5\ -1\ -4]$ , what is the resulting camera transformation matrix?
198. Given a camera position of  $[2\ 0\ 0]$ , a gaze vector of  $[-4\ 2\ 3]$ , and an up vector of  $[2\ -5\ -5]$ , what is the resulting camera transformation matrix?
199. Project point  $[3\ -1\ -3\ 1]$  onto the plane  $n=4$ .
  - a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)
  - b) What will  $px$ ,  $py$  be after perspective division?
200. Perspective division transforms \_\_\_\_\_ coordinates into 2d coordinates.
201. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
202. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-1$ ,  $r=-3$ ,  $l=1$ ,  $n=4$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).

203. Create a matrix to transform a paralleliped defined by  $t=0$ ,  $b=-4$ ,  $r=0$ ,  $l=-2$ ,  $n=3$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
204. Project point  $[-3 \ 0 \ -1 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
205. Project point  $[-2 \ -4 \ -5 \ 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
206. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
207. Given a camera position of  $[ \ 0 \ -1 \ 0]$ , a gaze vector of  $[ \ 2 \ -3 \ -1]$ , and an up vector of  $[-2 \ -3 \ 3]$ , what is the resulting camera transformation matrix?
208. Perspective division transforms ----- space into 2d space.
209. Given a camera position of  $[3 \ 4 \ 1]$ , a gaze vector of  $[-2 \ -1 \ -1]$ , and an up vector of  $[-4 \ 3 \ 3]$ , what is the resulting camera transformation matrix?
210. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
211. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a paralleliped.
212. Given a camera position of  $[-3 \ -5 \ -3]$ , a gaze vector of  $[ \ 3 \ -3 \ 2]$ , and an up vector of  $[-4 \ 3 \ 3]$ , what is the resulting camera transformation matrix?
213. Project point  $[-4 \ 0 \ -4 \ 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
214. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a paralleliped.
215. The projection transformation transforms camera coordinates into ----- coordinates.
216. The projection transformation transforms eye space into ----- space.
217. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
218. Project point  $[ \ 4 \ -5 \ 4 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?

219. Given a camera position of  $[4\ 3\ -2]$ , a gaze vector of  $[1\ -4\ 3]$ , and an up vector of  $[0\ -5\ -5]$ , what is the resulting camera transformation matrix?
220. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
221. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
222. Given a camera position of  $[3\ 0\ 0]$ , a gaze vector of  $[1\ -5\ -5]$ , and an up vector of  $[4\ -4\ -3]$ , what is the resulting camera transformation matrix?
223. Project point  $[0\ 1\ 3\ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
224. Project point  $[2\ 1\ 3\ 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
225. Given a camera position of  $[-5\ -1\ -5]$ , a gaze vector of  $[-5\ 2\ 0]$ , and an up vector of  $[-3\ -1\ -1]$ , what is the resulting camera transformation matrix?
226. Project point  $[1\ 1\ 3\ 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
227. Given a camera position of  $[3\ -4\ 1]$ , a gaze vector of  $[-5\ 3\ 0]$ , and an up vector of  $[3\ 0\ -5]$ , what is the resulting camera transformation matrix?
228. Perspective division transforms the canonical view volume into \_\_\_\_\_ coordinates.
229. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
230. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-1$ ,  $r=-1$ ,  $l=-2$ ,  $n=4$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
231. Given a camera position of  $[-4\ 2\ -3]$ , a gaze vector of  $[-1\ 0\ -2]$ , and an up vector of  $[-5\ 0\ -2]$ , what is the resulting camera transformation matrix?
232. The model transformation transforms object coordinates into \_\_\_\_\_ coordinates.
233. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
234. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.

235. Project point  $[-1 \ -4 \ -2 \ 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
236. Project point  $[-4 \ 4 \ -3 \ 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
237. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
238. Project point  $[4 \ -2 \ 3 \ 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
239. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
240. The \_\_\_\_\_ transformation transforms object space into world space.
241. Project point  $[-2 \ 1 \ 2 \ 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
242. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
243. Given a camera position of  $[0 \ -5 \ 2]$ , a gaze vector of  $[4 \ -3 \ -1]$ , and an up vector of  $[-5 \ -4 \ -3]$ , what is the resulting camera transformation matrix?
244. Project point  $[4 \ 2 \ -4 \ 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
245. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-4$ ,  $r=-4$ ,  $l=3$ ,  $n=1$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
246. Given a camera position of  $[-4 \ 1 \ 4]$ , a gaze vector of  $[0 \ 2 \ -2]$ , and an up vector of  $[3 \ 4 \ 0]$ , what is the resulting camera transformation matrix?
247. The model transformation transforms object space into \_\_\_\_\_ space.
248. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
249. Given a camera position of  $[0 \ -5 \ -4]$ , a gaze vector of  $[3 \ -3 \ 2]$ , and an up vector of  $[-1 \ 0 \ -4]$ , what is the resulting camera transformation matrix?

250. The \_\_\_\_\_ transformation transforms eye coordinates into the canonical view volume.
251. The projection transformation transforms camera space into \_\_\_\_\_ space.
252. Given a camera position of  $[3 \ -4 \ 2]$ , a gaze vector of  $[1 \ 3 \ -4]$ , and an up vector of  $[1 \ 0 \ -5]$ , what is the resulting camera transformation matrix?
253. The camera transformation transforms world space into \_\_\_\_\_ space.
254. Project point  $[0 \ 2 \ -2 \ 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
255. Project point  $[-5 \ -2 \ -1 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
256. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
257. Project point  $[-3 \ 3 \ -1 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
258. The projection transformation transforms \_\_\_\_\_ space into the canonical view volume.
259. Project point  $[-1 \ 1 \ 1 \ 1]$  onto the plane  $n=-4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
260. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
261. Project point  $[-3 \ -3 \ -5 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
262. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
263. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=3$ ,  $r=3$ ,  $l=2$ ,  $n=1$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
264. Given a camera position of  $[-5 \ -3 \ 3]$ , a gaze vector of  $[-3 \ -1 \ -1]$ , and an up vector of  $[-3 \ 0 \ 2]$ , what is the resulting camera transformation matrix?



265. Project point  $[4\ 1\ -5\ 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
266. The \_\_\_\_\_ transformation transforms eye space into clip space.
267. Given a camera position of  $[0\ -2\ -2]$ , a gaze vector of  $[4\ -1\ -1]$ , and an up vector of  $[-3\ 1\ 2]$ , what is the resulting camera transformation matrix?
268. Project point  $[3\ 1\ 4\ 1]$  onto the plane  $n=3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
269. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
270. Create a matrix to transform a parallelepiped defined by  $t=3$ ,  $b=-5$ ,  $r=2$ ,  $l=-5$ ,  $n=-5$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
271. Project point  $[2\ 3\ -5\ 1]$  onto the plane  $n=-4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
272. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=4$ ,  $r=-2$ ,  $l=4$ ,  $n=4$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
273. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
274. Given a camera position of  $[-4\ 4\ 0]$ , a gaze vector of  $[0\ 3\ -2]$ , and an up vector of  $[4\ -4\ -5]$ , what is the resulting camera transformation matrix?
275. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-1$ ,  $r=-5$ ,  $l=4$ ,  $n=-5$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
276. Project point  $[-3\ -2\ -2\ 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
277. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
278. Project point  $[-5\ -3\ 4\ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
279. Create a matrix to transform a parallelepiped defined by  $t=-5$ ,  $b=4$ ,  $r=-4$ ,  $l=4$ ,  $n=-2$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).

280. Create a matrix to transform a parallelepiped defined by  $t=3$ ,  $b=-4$ ,  $r=-2$ ,  $l=3$ ,  $n=0$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
281. Perspective division transforms \_\_\_\_\_ space into 2d space.
282. Project point  $[-1 \ 1 \ 3 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
283. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
284. The \_\_\_\_\_ transformation transforms object coordinates into world coordinates.
285. Given a camera position of  $[-5 \ 0 \ 3]$ , a gaze vector of  $[-5 \ 4 \ 1]$ , and an up vector of  $[-3 \ 3 \ 4]$ , what is the resulting camera transformation matrix?
286. The \_\_\_\_\_ transformation transforms the canonical view volume into 2d space.
287. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=2$ ,  $r=-3$ ,  $l=0$ ,  $n=1$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).
288. Given a camera position of  $[-4 \ 3 \ -4]$ , a gaze vector of  $[0 \ -1 \ -3]$ , and an up vector of  $[-4 \ -3 \ 3]$ , what is the resulting camera transformation matrix?
289. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-4$ ,  $r=1$ ,  $l=-2$ ,  $n=-4$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).
290. Project point  $[-5 \ -3 \ 4 \ 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
291. Project point  $[2 \ 4 \ 0 \ 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
292. Perspective division transforms \_\_\_\_\_ coordinates into 2d coordinates.
293. The model transformation transforms \_\_\_\_\_ space into world space.
294. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=3$ ,  $r=0$ ,  $l=-4$ ,  $n=-4$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).
295. Project point  $[-3 \ 4 \ 4 \ 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
296. Project point  $[-5 \ 1 \ -4 \ 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?

297. The view transformation transforms world coordinates into \_\_\_\_\_ coordinates.
298. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=-2$ ,  $r=-1$ ,  $l=4$ ,  $n=4$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
299. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
300. The \_\_\_\_\_ transformation transforms world space into \_\_\_\_\_ space.
301. The viewport transformation transforms \_\_\_\_\_ coordinates into screen coordinates.
302. Project point  $[-5 \ 0 \ 1 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
303. Given a camera position of  $[-4 \ 2 \ -3]$ , a gaze vector of  $[-1 \ 2 \ 4]$ , and an up vector of  $[2 \ -3 \ 2]$ , what is the resulting camera transformation matrix?
304. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
305. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=-4$ ,  $r=-5$ ,  $l=-3$ ,  $n=2$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
306. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
307. Given a camera position of  $[-4 \ -5 \ 1]$ , a gaze vector of  $[-3 \ -4 \ 1]$ , and an up vector of  $[3 \ 4 \ -3]$ , what is the resulting camera transformation matrix?
308. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
309. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
310. Given a camera position of  $[1 \ 3 \ -2]$ , a gaze vector of  $[0 \ -2 \ 3]$ , and an up vector of  $[-3 \ 1 \ -3]$ , what is the resulting camera transformation matrix?
311. Project point  $[0 \ 2 \ 4 \ 1]$  onto the plane  $n=3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
312. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
313. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
314. Given a camera position of  $[2 \ -4 \ -5]$ , a gaze vector of  $[3 \ -3 \ 4]$ , and an up vector of  $[2 \ -3 \ 2]$ , what is the resulting camera transformation matrix?

315. Project point  $[-4 \ 2 \ -2 \ 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
316. Project point  $[4 \ -2 \ -5 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
317. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
318. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
319. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
320. Given a camera position of  $[0 \ -4 \ 0]$ , a gaze vector of  $[-3 \ -1 \ -1]$ , and an up vector of  $[2 \ 2 \ 1]$ , what is the resulting camera transformation matrix?
321. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
322. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-4$ ,  $r=-2$ ,  $l=4$ ,  $n=-1$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
323. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
324. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
325. Given a camera position of  $[-4 \ -3 \ 1]$ , a gaze vector of  $[-3 \ -4 \ 3]$ , and an up vector of  $[-3 \ -4 \ -5]$ , what is the resulting camera transformation matrix?
326. Project point  $[-5 \ -3 \ -3 \ 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
327. The viewport transformation transforms 2d coordinates into \_\_\_\_\_ coordinates.
328. Given a camera position of  $[-4 \ 1 \ 1]$ , a gaze vector of  $[-5 \ 4 \ -3]$ , and an up vector of  $[-4 \ 0 \ 1]$ , what is the resulting camera transformation matrix?
329. The viewport transformation transforms \_\_\_\_\_ coordinates into screen coordinates.
330. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
331. The viewport transformation transforms 2d coordinates into \_\_\_\_\_ coordinates.

332. The \_\_\_\_\_ transformation transforms object coordinates into world coordinates.
333. Project point  $[-5 \ -2 \ 4 \ 1]$  onto the plane  $n=3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
334. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=4$ ,  $r=-1$ ,  $l=4$ ,  $n=2$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).
335. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
336. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
337. Project point  $[-5 \ -4 \ 0 \ 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
338. The \_\_\_\_\_ transformation transforms the canonical view volume into 2d space.
339. Project point  $[-2 \ 2 \ -3 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
340. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=0$ ,  $r=2$ ,  $l=1$ ,  $n=2$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).
341. Project point  $[4 \ 0 \ -3 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
342. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=-1$ ,  $r=-5$ ,  $l=-4$ ,  $n=-4$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).
343. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=-3$ ,  $r=-4$ ,  $l=-3$ ,  $n=1$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
344. Perspective division transforms clip coordinates into \_\_\_\_\_ coordinates.
345. Given a camera position of  $[-3 \ -1 \ 4]$ , a gaze vector of  $[-3 \ 4 \ -5]$ , and an up vector of  $[3 \ -1 \ 1]$ , what is the resulting camera transformation matrix?
346. Given a camera position of  $[0 \ 3 \ -5]$ , a gaze vector of  $[2 \ 2 \ -3]$ , and an up vector of  $[3 \ -3 \ 2]$ , what is the resulting camera transformation matrix?
347. The \_\_\_\_\_ transformation transforms world coordinates into \_\_\_\_\_ coordinates.
348. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=3$ ,  $r=2$ ,  $l=-2$ ,  $n=-5$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).

349. Given a camera position of  $[-3 \ 0 \ -4]$ , a gaze vector of  $[ \ 3 \ -5 \ 3]$ , and an up vector of  $[ \ 2 \ -4 \ -5]$ , what is the resulting camera transformation matrix?
350. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=-2$ ,  $r=-2$ ,  $l=-3$ ,  $n=0$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
351. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
352. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
353. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=-1$ ,  $r=4$ ,  $l=2$ ,  $n=-5$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
354. The camera transformation transforms world coordinates into \_\_\_\_\_ coordinates.
355. Project point  $[1 \ 0 \ 4 \ 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
356. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
357. Create a matrix to transform a parallelepiped defined by  $t=-5$ ,  $b=4$ ,  $r=3$ ,  $l=-5$ ,  $n=-4$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).
358. The viewport transformation transforms \_\_\_\_\_ space into screen space.
359. Project point  $[-3 \ -2 \ 3 \ 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
360. Given a camera position of  $[-5 \ -3 \ 1]$ , a gaze vector of  $[ \ 2 \ 4 \ -1]$ , and an up vector of  $[-3 \ -5 \ 1]$ , what is the resulting camera transformation matrix?
361. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=-5$ ,  $r=0$ ,  $l=-3$ ,  $n=-4$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
362. Given a camera position of  $[ \ 3 \ -1 \ 0]$ , a gaze vector of  $[-3 \ -3 \ -4]$ , and an up vector of  $[-1 \ 2 \ 3]$ , what is the resulting camera transformation matrix?
363. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=0$ ,  $r=0$ ,  $l=-2$ ,  $n=-1$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
364. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
365. Project point  $[-1 \ 0 \ -3 \ 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?

366. Project point  $[0 -2 3 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
367. Given a camera position of  $[1 -2 -3]$ , a gaze vector of  $[4 -1 4]$ , and an up vector of  $[2 1 0]$ , what is the resulting camera transformation matrix?
368. Given a camera position of  $[1 4 -2]$ , a gaze vector of  $[2 -3 1]$ , and an up vector of  $[2 -4 -2]$ , what is the resulting camera transformation matrix?
369. The \_\_\_\_\_ transformation transforms \_\_\_\_\_ space into world space.
370. The \_\_\_\_\_ transformation transforms world coordinates into eye coordinates.
371. Given a camera position of  $[1 4 4]$ , a gaze vector of  $[4 -1 3]$ , and an up vector of  $[-2 -1 1]$ , what is the resulting camera transformation matrix?
372. Given a camera position of  $[2 1 3]$ , a gaze vector of  $[-1 -1 -4]$ , and an up vector of  $[1 -4 3]$ , what is the resulting camera transformation matrix?
373. Given a camera position of  $[0 4 -5]$ , a gaze vector of  $[4 0 -3]$ , and an up vector of  $[2 0 -1]$ , what is the resulting camera transformation matrix?
374. Project point  $[4 -3 4 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
375. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
376. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=1$ ,  $r=-4$ ,  $l=1$ ,  $n=-5$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
377. Project point  $[-2 -1 0 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
378. The \_\_\_\_\_ transformation transforms world coordinates into \_\_\_\_\_ coordinates.
379. The \_\_\_\_\_ transformation transforms \_\_\_\_\_ coordinates into world coordinates.
380. Project point  $[-1 -5 -3 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
381. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=3$ ,  $r=3$ ,  $l=-2$ ,  $n=1$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
382. The model transformation transforms \_\_\_\_\_ coordinates into world coordinates.

383. Given a camera position of  $[4 \ 4 \ 0]$ , a gaze vector of  $[2 \ 2 \ -2]$ , and an up vector of  $[-5 \ -2 \ -2]$ , what is the resulting camera transformation matrix?
384. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=4$ ,  $r=1$ ,  $l=-4$ ,  $n=-1$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
385. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
386. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
387. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
388. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
389. Given a camera position of  $[-3 \ 1 \ 1]$ , a gaze vector of  $[4 \ 1 \ -4]$ , and an up vector of  $[-4 \ 0 \ 0]$ , what is the resulting camera transformation matrix?
390. The \_\_\_\_\_ transformation transforms 2d coordinates into screen coordinates.
391. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=3$ ,  $r=4$ ,  $l=1$ ,  $n=-4$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).
392. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
393. Given a camera position of  $[-1 \ 4 \ -5]$ , a gaze vector of  $[-5 \ 4 \ 0]$ , and an up vector of  $[1 \ 2 \ 2]$ , what is the resulting camera transformation matrix?
394. Given a camera position of  $[-2 \ -5 \ 2]$ , a gaze vector of  $[-1 \ -1 \ 4]$ , and an up vector of  $[0 \ -2 \ -4]$ , what is the resulting camera transformation matrix?
395. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
396. Project point  $[-5 \ -2 \ -5 \ 1]$  onto the plane  $n=-2$ .  
a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
b) What will  $px$ ,  $py$  be after perspective division?
397. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
398. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
399. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=-3$ ,  $r=-4$ ,  $l=1$ ,  $n=-2$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
400. The projection transformation transforms eye coordinates into \_\_\_\_\_ coordinates.



401. The view transformation transforms \_\_\_\_\_ space into camera space.
402. Given a camera position of  $[-4 -2 1]$ , a gaze vector of  $[0 -2 -2]$ , and an up vector of  $[-3 -5 3]$ , what is the resulting camera transformation matrix?
403. The \_\_\_\_\_ transformation transforms camera coordinates into the canonical view volume.
404. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
405. The \_\_\_\_\_ transformation transforms camera space into the canonical view volume.
406. The \_\_\_\_\_ transformation transforms world coordinates into eye coordinates.
407. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=1$ ,  $r=4$ ,  $l=-5$ ,  $n=0$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).
408. Project point  $[-1 -2 4 1]$  onto the plane  $n=-5$ .  
a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
b) What will  $px$ ,  $py$  be after perspective division?
409. Project point  $[4 1 3 1]$  onto the plane  $n=1$ .  
a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
b) What will  $px$ ,  $py$  be after perspective division?
410. The \_\_\_\_\_ transformation transforms clip coordinates into 2d coordinates.
411. Given a camera position of  $[1 -4 -1]$ , a gaze vector of  $[-2 -5 2]$ , and an up vector of  $[-2 -2 1]$ , what is the resulting camera transformation matrix?
412. Given a camera position of  $[-1 2 2]$ , a gaze vector of  $[-5 3 -1]$ , and an up vector of  $[-5 -2 3]$ , what is the resulting camera transformation matrix?
413. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
414. Project point  $[-5 -5 -1 1]$  onto the plane  $n=4$ .  
a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
b) What will  $px$ ,  $py$  be after perspective division?
415. Project point  $[-2 -5 1 1]$  onto the plane  $n=4$ .  
a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
b) What will  $px$ ,  $py$  be after perspective division?
416. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
417. The viewport transformation transforms \_\_\_\_\_ coordinates into screen coordinates.

418. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=-5$ ,  $r=-1$ ,  $l=-5$ ,  $n=-4$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
419. Given a camera position of  $[-2 -1 0]$ , a gaze vector of  $[3 4 -3]$ , and an up vector of  $[2 -5 1]$ , what is the resulting camera transformation matrix?
420. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
421. The \_\_\_\_\_ transformation transforms 2d coordinates into screen coordinates.
422. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
423. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
424. The camera transformation transforms \_\_\_\_\_ space into camera space.
425. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
426. The projection transformation transforms \_\_\_\_\_ space into the canonical view volume.
427. Project point  $[0 3 0 1]$  onto the plane  $n=-4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
428. Given a camera position of  $[-2 3 -3]$ , a gaze vector of  $[2 -5 -1]$ , and an up vector of  $[4 4 3]$ , what is the resulting camera transformation matrix?
429. Project point  $[-2 -2 4 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
430. Project point  $[0 3 -2 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
431. The projection transformation transforms \_\_\_\_\_ coordinates into clip coordinates.
432. The viewport transformation transforms 2d space into \_\_\_\_\_ space.
433. Given a camera position of  $[-5 -3 4]$ , a gaze vector of  $[-3 0 1]$ , and an up vector of  $[0 1 -1]$ , what is the resulting camera transformation matrix?
434. The viewport transformation transforms 2d space into \_\_\_\_\_ space.
435. Given a camera position of  $[0 -1 -5]$ , a gaze vector of  $[1 -2 -3]$ , and an up vector of  $[-4 -2 -3]$ , what is the resulting camera transformation matrix?

436. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=3$ ,  $r=0$ ,  $l=2$ ,  $n=-2$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
437. Perspective division transforms \_\_\_\_\_ coordinates into 2d coordinates.
438. Given a camera position of  $[-2 \ 1 \ 3]$ , a gaze vector of  $[0 \ -4 \ -3]$ , and an up vector of  $[0 \ -3 \ -1]$ , what is the resulting camera transformation matrix?
439. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
440. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=-5$ ,  $r=3$ ,  $l=-4$ ,  $n=-3$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
441. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
442. The viewport transformation transforms 2d coordinates into \_\_\_\_\_ coordinates.
443. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
444. The \_\_\_\_\_ transformation transforms world space into eye space.
445. Given a camera position of  $[-4 \ -5 \ -4]$ , a gaze vector of  $[-5 \ -2 \ 3]$ , and an up vector of  $[-2 \ -3 \ 1]$ , what is the resulting camera transformation matrix?
446. Given a camera position of  $[-3 \ 2 \ 2]$ , a gaze vector of  $[-4 \ 4 \ -5]$ , and an up vector of  $[-2 \ 1 \ 1]$ , what is the resulting camera transformation matrix?
447. Project point  $[3 \ -5 \ -4 \ 1]$  onto the plane  $n=-2$ .  
a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
b) What will  $p_x$ ,  $p_y$  be after perspective division?
448. Given a camera position of  $[-5 \ -3 \ 0]$ , a gaze vector of  $[2 \ 2 \ -1]$ , and an up vector of  $[-5 \ 1 \ -3]$ , what is the resulting camera transformation matrix?
449. The view transformation transforms world coordinates into \_\_\_\_\_ coordinates.
450. Project point  $[2 \ -4 \ -4 \ 1]$  onto the plane  $n=-5$ .  
a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
b) What will  $p_x$ ,  $p_y$  be after perspective division?
451. Given a camera position of  $[-4 \ -2 \ 2]$ , a gaze vector of  $[3 \ 0 \ -4]$ , and an up vector of  $[1 \ -1 \ 1]$ , what is the resulting camera transformation matrix?
452. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
453. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=1$ ,  $r=-3$ ,  $l=-1$ ,  $n=0$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).

454. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
455. Project point  $[-1 \ 2 \ -4 \ 1]$  onto the plane  $n=-4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
456. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
457. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
458. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
459. Given a camera position of  $[3 \ 3 \ 3]$ , a gaze vector of  $[-4 \ 2 \ -2]$ , and an up vector of  $[3 \ -3 \ -4]$ , what is the resulting camera transformation matrix?
460. Project point  $[-4 \ -1 \ 3 \ 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
461. Project point  $[-1 \ -4 \ -5 \ 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
462. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=2$ ,  $r=-3$ ,  $l=0$ ,  $n=-4$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
463. Given a camera position of  $[-3 \ -1 \ -2]$ , a gaze vector of  $[-2 \ 0 \ 2]$ , and an up vector of  $[3 \ 2 \ 1]$ , what is the resulting camera transformation matrix?
464. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
465. The viewport transformation transforms \_\_\_\_\_ coordinates into screen coordinates.
466. The viewport transformation transforms \_\_\_\_\_ space into screen space.
467. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
468. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
469. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-2$ ,  $r=2$ ,  $l=1$ ,  $n=-2$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
470. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.

471. Project point  $[1\ 0\ -4\ 1]$  onto the plane  $n=-4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
472. Project point  $[-3\ -5\ 3\ 1]$  onto the plane  $n=-4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
473. The model transformation transforms model space into \_\_\_\_\_ space.
474. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
475. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
476. Project point  $[-3\ 0\ 4\ 1]$  onto the plane  $n=3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
477. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
478. Given a camera position of  $[-5\ 1\ 0]$ , a gaze vector of  $[1\ -2\ 2]$ , and an up vector of  $[-2\ 4\ -1]$ , what is the resulting camera transformation matrix?
479. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
480. The viewport transformation transforms 2d coordinates into \_\_\_\_\_ coordinates.
481. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=1$ ,  $r=-3$ ,  $l=-5$ ,  $n=1$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).
482. Project point  $[-4\ -1\ -1\ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
483. Project point  $[-5\ -4\ -4\ 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
484. The \_\_\_\_\_ transformation transforms \_\_\_\_\_ coordinates into world coordinates.
485. Project point  $[2\ -5\ 0\ 1]$  onto the plane  $n=3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?

486. Project point  $[-5 -5 1 1]$  onto the plane  $n=3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
487. The \_\_\_\_\_ transformation transforms 2d coordinates into screen coordinates.
488. Project point  $[-4 -2 -1 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
489. The \_\_\_\_\_ transformation transforms world coordinates into eye coordinates.
490. Project point  $[4 2 3 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
491. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
492. The model transformation transforms model space into \_\_\_\_\_ space.
493. Given a camera position of  $[1 -4 -1]$ , a gaze vector of  $[2 3 -5]$ , and an up vector of  $[-4 -1 2]$ , what is the resulting camera transformation matrix?
494. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-1$ ,  $r=5$ ,  $l=4$ ,  $n=3$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
495. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-1$ ,  $r=1$ ,  $l=0$ ,  $n=-3$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
496. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=1$ ,  $r=3$ ,  $l=-2$ ,  $n=-5$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
497. Given a camera position of  $[-1 4 -3]$ , a gaze vector of  $[-1 -1 4]$ , and an up vector of  $[0 2 -5]$ , what is the resulting camera transformation matrix?
498. Project point  $[-1 -5 1 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
499. Project point  $[-3 2 3 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
500. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=4$ ,  $r=-2$ ,  $l=-1$ ,  $n=3$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).

501. Project point  $[-1 \ 0 \ -2 \ 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
502. Project point  $[-3 \ 4 \ -5 \ 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
503. Given a camera position of  $[ \ 3 \ -4 \ -2]$ , a gaze vector of  $[-1 \ 2 \ 3]$ , and an up vector of  $[2 \ 2 \ 1]$ , what is the resulting camera transformation matrix?
504. Project point  $[-2 \ 2 \ 2 \ 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
505. Given a camera position of  $[-2 \ -1 \ 0]$ , a gaze vector of  $[ \ 0 \ 2 \ -4]$ , and an up vector of  $[ \ 3 \ -1 \ 1]$ , what is the resulting camera transformation matrix?
506. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
507. Project point  $[-3 \ -2 \ -5 \ 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
508. The ----- transformation transforms clip coordinates into 2d coordinates.
509. Project point  $[ \ 1 \ -2 \ 1 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
510. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=2$ ,  $r=-5$ ,  $l=0$ ,  $n=3$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
511. Given a camera position of  $[ \ 4 \ -4 \ -4]$ , a gaze vector of  $[ \ 3 \ 2 \ -4]$ , and an up vector of  $[-1 \ 0 \ -3]$ , what is the resulting camera transformation matrix?
512. Given a camera position of  $[ \ 2 \ 2 \ -1]$ , a gaze vector of  $[ \ 0 \ -4 \ 2]$ , and an up vector of  $[ \ 4 \ -3 \ -3]$ , what is the resulting camera transformation matrix?
513. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
514. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=-3$ ,  $r=1$ ,  $l=-5$ ,  $n=-3$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).

515. Project point  $[0 -3 -3 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
516. Given a camera position of  $[3 2 -5]$ , a gaze vector of  $[4 3 2]$ , and an up vector of  $[4 3 0]$ , what is the resulting camera transformation matrix?
517. The \_\_\_\_\_ transformation transforms world coordinates into eye coordinates.
518. Project point  $[-5 4 3 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
519. Given a camera position of  $[-3 -2 1]$ , a gaze vector of  $[-1 -5 -1]$ , and an up vector of  $[0 -2 1]$ , what is the resulting camera transformation matrix?
520. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
521. Given a camera position of  $[-2 -4 1]$ , a gaze vector of  $[4 0 -3]$ , and an up vector of  $[-1 3 3]$ , what is the resulting camera transformation matrix?
522. Project point  $[-3 3 4 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
523. Given a camera position of  $[-2 3 -2]$ , a gaze vector of  $[-5 -3 -2]$ , and an up vector of  $[-2 -3 -2]$ , what is the resulting camera transformation matrix?
524. Project point  $[-5 1 -2 1]$  onto the plane  $n=2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
525. Given a camera position of  $[-5 2 2]$ , a gaze vector of  $[-4 1 2]$ , and an up vector of  $[0 0 0]$ , what is the resulting camera transformation matrix?
526. Given a camera position of  $[0 4 -1]$ , a gaze vector of  $[4 4 2]$ , and an up vector of  $[1 -3 -3]$ , what is the resulting camera transformation matrix?
527. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
528. Project point  $[1 -4 -1 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
529. Given a camera position of  $[-3 -5 -2]$ , a gaze vector of  $[0 -4 4]$ , and an up vector of  $[-5 -4 2]$ , what is the resulting camera transformation matrix?



530. The \_\_\_\_\_ transformation transforms the canonical view volume into 2d coordinates.
531. Project point  $[-2 \ 0 \ 1 \ 1]$  onto the plane  $n=2$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
532. The projection transformation transforms \_\_\_\_\_ space into the canonical view volume.
533. The \_\_\_\_\_ transformation transforms camera coordinates into clip coordinates.
534. Project point  $[-5 \ 1 \ -5 \ 1]$  onto the plane  $n=-4$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
535. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=-5$ ,  $r=-1$ ,  $l=-5$ ,  $n=-4$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
536. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
537. Project point  $[3 \ 1 \ 4 \ 1]$  onto the plane  $n=-2$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
538. The \_\_\_\_\_ transformation transforms 2d coordinates into screen coordinates.
539. The \_\_\_\_\_ transformation transforms world space into camera space.
540. Given a camera position of  $[-3 \ 4 \ -4]$ , a gaze vector of  $[4 \ -2 \ 0]$ , and an up vector of  $[4 \ -5 \ -5]$ , what is the resulting camera transformation matrix?
541. Given a camera position of  $[-3 \ 0 \ -4]$ , a gaze vector of  $[-1 \ 0 \ 4]$ , and an up vector of  $[2 \ 3 \ -3]$ , what is the resulting camera transformation matrix?
542. Given a camera position of  $[2 \ -4 \ -3]$ , a gaze vector of  $[2 \ 4 \ 3]$ , and an up vector of  $[-1 \ -5 \ 1]$ , what is the resulting camera transformation matrix?
543. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=-3$ ,  $r=2$ ,  $l=-4$ ,  $n=-3$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).
544. The model transformation transforms model space into \_\_\_\_\_ space.
545. Project point  $[3 \ 0 \ -1 \ 1]$  onto the plane  $n=3$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
546. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=3$ ,  $r=-3$ ,  $l=1$ ,  $n=2$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
547. The viewport transformation transforms 2d coordinates into \_\_\_\_\_ coordinates.

548. Perspective division transforms \_\_\_\_\_ space into 2d space.
549. Project point  $[-2 \ 1 \ -1 \ 1]$  onto the plane  $n=-4$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
550. The \_\_\_\_\_ transformation transforms the canonical view volume into 2d coordinates.
551. The viewport transformation transforms 2d coordinates into \_\_\_\_\_ coordinates.
552. Given a camera position of  $[-5 \ 0 \ 0]$ , a gaze vector of  $[4 \ 1 \ 3]$ , and an up vector of  $[-2 \ 1 \ 4]$ , what is the resulting camera transformation matrix?
553. Perspective division transforms \_\_\_\_\_ coordinates into 2d coordinates.
554. The \_\_\_\_\_ transformation transforms world coordinates into \_\_\_\_\_ coordinates.
555. Project point  $[-3 \ 4 \ 4 \ 1]$  onto the plane  $n=-4$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
556. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=3$ ,  $r=-5$ ,  $l=-2$ ,  $n=-1$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
557. Given a camera position of  $[3 \ 2 \ 2]$ , a gaze vector of  $[0 \ 0 \ -4]$ , and an up vector of  $[1 \ -3 \ 1]$ , what is the resulting camera transformation matrix?
558. Given a camera position of  $[-3 \ -2 \ 2]$ , a gaze vector of  $[4 \ 0 \ 3]$ , and an up vector of  $[3 \ -1 \ 3]$ , what is the resulting camera transformation matrix?
559. The \_\_\_\_\_ transformation transforms \_\_\_\_\_ space into world space.
560. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-5$ ,  $r=-1$ ,  $l=-4$ ,  $n=4$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
561. The viewport transformation transforms 2d coordinates into \_\_\_\_\_ coordinates.
562. The view transformation transforms world space into \_\_\_\_\_ space.
563. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
564. Project point  $[4 \ -5 \ 3 \ 1]$  onto the plane  $n=-3$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
565. The \_\_\_\_\_ transformation transforms \_\_\_\_\_ coordinates into world coordinates.
566. Project point  $[3 \ -2 \ -2 \ 1]$  onto the plane  $n=-1$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?

567. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
568. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
569. The projection transformation transforms eye coordinates into \_\_\_\_\_ coordinates.
570. Given a camera position of  $[4\ 0\ -1]$ , a gaze vector of  $[-3\ -4\ 4]$ , and an up vector of  $[1\ 2\ -5]$ , what is the resulting camera transformation matrix?
571. Given a camera position of  $[-2\ 4\ 4]$ , a gaze vector of  $[-3\ -1\ 2]$ , and an up vector of  $[1\ 4\ 2]$ , what is the resulting camera transformation matrix?
572. Given a camera position of  $[-5\ 4\ 0]$ , a gaze vector of  $[-5\ 2\ -2]$ , and an up vector of  $[-1\ 4\ 2]$ , what is the resulting camera transformation matrix?
573. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
574. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=-2$ ,  $r=-2$ ,  $l=-3$ ,  $n=-1$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
575. The viewport transformation transforms \_\_\_\_\_ space into screen space.
576. The projection transformation transforms \_\_\_\_\_ coordinates into clip coordinates.
577. The viewport transformation transforms 2d coordinates into \_\_\_\_\_ coordinates.
578. The viewport transformation transforms 2d space into \_\_\_\_\_ space.
579. Project point  $[1\ -4\ 0\ 1]$  onto the plane  $n=2$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
580. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=4$ ,  $r=-2$ ,  $l=1$ ,  $n=3$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
581. Project point  $[-5\ -4\ 0\ 1]$  onto the plane  $n=-4$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
582. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-1$ ,  $r=2$ ,  $l=4$ ,  $n=-3$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
583. Given a camera position of  $[1\ -2\ 2]$ , a gaze vector of  $[-3\ 4\ -4]$ , and an up vector of  $[-3\ 2\ 4]$ , what is the resulting camera transformation matrix?
584. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.

585. Project point  $[0 \ -5 \ 3 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
586. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=-4$ ,  $r=2$ ,  $l=0$ ,  $n=3$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).
587. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=0$ ,  $r=4$ ,  $l=2$ ,  $n=0$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
588. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
589. The \_\_\_\_\_ transformation transforms 2d space into screen space.
590. Project point  $[2 \ -2 \ -2 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
591. Project point  $[2 \ -1 \ -4 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
592. Given a camera position of  $[1 \ 0 \ 4]$ , a gaze vector of  $[-1 \ -1 \ 2]$ , and an up vector of  $[0 \ -4 \ -5]$ , what is the resulting camera transformation matrix?
593. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
594. The \_\_\_\_\_ transformation transforms world space into \_\_\_\_\_ space.
595. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
596. The viewport transformation transforms 2d coordinates into \_\_\_\_\_ coordinates.
597. Given a camera position of  $[1 \ -5 \ 1]$ , a gaze vector of  $[-5 \ 3 \ -1]$ , and an up vector of  $[2 \ -1 \ 2]$ , what is the resulting camera transformation matrix?
598. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
599. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
600. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
601. Project point  $[-1 \ 0 \ -5 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?

602. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
603. The model transformation transforms object space into \_\_\_\_\_ space.
604. Project point  $[-4 -3 -4 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
605. Given a camera position of  $[0 -2 4]$ , a gaze vector of  $[-3 2 -1]$ , and an up vector of  $[2 -5 4]$ , what is the resulting camera transformation matrix?
606. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=-3$ ,  $r=-3$ ,  $l=-2$ ,  $n=-5$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
607. Given a camera position of  $[4 -3 1]$ , a gaze vector of  $[-1 2 1]$ , and an up vector of  $[-5 1 -1]$ , what is the resulting camera transformation matrix?
608. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
609. Project point  $[3 2 4 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
610. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=0$ ,  $r=2$ ,  $l=-3$ ,  $n=4$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
611. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
612. The model transformation transforms object space into \_\_\_\_\_ space.
613. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
614. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
615. Project point  $[-5 -1 -4 1]$  onto the plane  $n=-4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
616. Given a camera position of  $[0 0 -4]$ , a gaze vector of  $[-3 2 -1]$ , and an up vector of  $[0 -3 2]$ , what is the resulting camera transformation matrix?
617. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=0$ ,  $r=3$ ,  $l=-5$ ,  $n=4$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
618. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-4$ ,  $r=-4$ ,  $l=-2$ ,  $n=-1$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).

619. Given a camera position of  $[0\ 3\ -4]$ , a gaze vector of  $[4\ 1\ 4]$ , and an up vector of  $[-3\ 3\ -4]$ , what is the resulting camera transformation matrix?
620. The view transformation transforms world space into \_\_\_\_\_ space.
621. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
622. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
623. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
624. Project point  $[4\ 2\ 2\ 1]$  onto the plane  $n=-1$ .  
a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
b) What will  $p_x$ ,  $p_y$  be after perspective division?
625. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=4$ ,  $r=-2$ ,  $l=-5$ ,  $n=3$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).
626. Perspective division transforms \_\_\_\_\_ coordinates into 2d coordinates.
627. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=-1$ ,  $r=3$ ,  $l=0$ ,  $n=2$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
628. The \_\_\_\_\_ transformation transforms \_\_\_\_\_ space into world space.
629. Create a matrix to transform a parallelepiped defined by  $t=-5$ ,  $b=0$ ,  $r=-4$ ,  $l=-5$ ,  $n=2$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
630. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
631. The \_\_\_\_\_ transformation transforms \_\_\_\_\_ space into world space.
632. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
633. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=-5$ ,  $r=-3$ ,  $l=2$ ,  $n=4$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
634. The view transformation transforms world coordinates into \_\_\_\_\_ coordinates.
635. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=0$ ,  $r=-1$ ,  $l=-5$ ,  $n=-1$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
636. Given a camera position of  $[1\ -2\ 0]$ , a gaze vector of  $[-2\ -1\ 3]$ , and an up vector of  $[2\ -3\ 4]$ , what is the resulting camera transformation matrix?
637. Given a camera position of  $[0\ -5\ -3]$ , a gaze vector of  $[1\ -2\ -2]$ , and an up vector of  $[1\ 0\ -4]$ , what is the resulting camera transformation matrix?
638. The model transformation transforms object space into \_\_\_\_\_ space.

639. Perspective division transforms clip space into \_\_\_\_\_ space.
640. Project point  $[-2 \ -5 \ 4 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
641. The model transformation transforms model space into \_\_\_\_\_ space.
642. Project point  $[0 \ -1 \ -2 \ 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
643. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
644. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=2$ ,  $r=-1$ ,  $l=-2$ ,  $n=3$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
645. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
646. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
647. Given a camera position of  $[0 \ 0 \ 0]$ , a gaze vector of  $[2 \ -3 \ -3]$ , and an up vector of  $[-1 \ -1 \ 4]$ , what is the resulting camera transformation matrix?
648. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=-3$ ,  $r=1$ ,  $l=-1$ ,  $n=-5$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
649. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-1$ ,  $r=2$ ,  $l=0$ ,  $n=-3$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
650. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=-4$ ,  $r=1$ ,  $l=2$ ,  $n=3$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
651. Given a camera position of  $[1 \ -1 \ 3]$ , a gaze vector of  $[-1 \ 4 \ -3]$ , and an up vector of  $[0 \ 4 \ 4]$ , what is the resulting camera transformation matrix?
652. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=1$ ,  $r=2$ ,  $l=-5$ ,  $n=1$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
653. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
654. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
655. The \_\_\_\_\_ transformation transforms \_\_\_\_\_ coordinates into world coordinates.
656. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-1$ ,  $r=-3$ ,  $l=3$ ,  $n=-1$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).

657. Project point  $[-4 \ 1 \ 1 \ 1]$  onto the plane  $n=2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
658. Project point  $[-1 \ -1 \ -4 \ 1]$  onto the plane  $n=2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
659. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=1$ ,  $r=4$ ,  $l=1$ ,  $n=-5$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
660. The \_\_\_\_\_ transformation transforms object space into world space.
661. The \_\_\_\_\_ transformation transforms 2d coordinates into screen coordinates.
662. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=-2$ ,  $r=-4$ ,  $l=-2$ ,  $n=3$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).
663. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
664. Given a camera position of  $[-5 \ -5 \ -1]$ , a gaze vector of  $[-5 \ 0 \ -4]$ , and an up vector of  $[2 \ 3 \ -3]$ , what is the resulting camera transformation matrix?
665. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
666. Project point  $[-1 \ -4 \ 3 \ 1]$  onto the plane  $n=3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
667. Perspective division transforms \_\_\_\_\_ space into 2d space.
668. Given a camera position of  $[4 \ -4 \ 0]$ , a gaze vector of  $[-1 \ 4 \ -5]$ , and an up vector of  $[2 \ 2 \ 3]$ , what is the resulting camera transformation matrix?
669. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=-5$ ,  $r=-2$ ,  $l=-1$ ,  $n=-4$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
670. The projection transformation transforms \_\_\_\_\_ space into the canonical view volume.
671. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=-5$ ,  $r=-2$ ,  $l=2$ ,  $n=-3$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
672. Given a camera position of  $[-4 \ 1 \ 1]$ , a gaze vector of  $[0 \ -3 \ -1]$ , and an up vector of  $[-4 \ -2 \ -4]$ , what is the resulting camera transformation matrix?
673. Project point  $[-3 \ 2 \ 0 \ 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?



674. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-4$ ,  $r=3$ ,  $l=-2$ ,  $n=3$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
675. The \_\_\_\_\_ transformation transforms clip space into 2d space.
676. Project point  $[4 -2 -1 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
677. Project point  $[-3 2 -4 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
678. The view transformation transforms world coordinates into \_\_\_\_\_ coordinates.
679. Given a camera position of  $[3 -1 -5]$ , a gaze vector of  $[1 -4 0]$ , and an up vector of  $[-4 2 4]$ , what is the resulting camera transformation matrix?
680. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-5$ ,  $r=2$ ,  $l=1$ ,  $n=1$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).
681. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
682. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=-3$ ,  $r=3$ ,  $l=2$ ,  $n=2$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
683. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
684. Project point  $[2 4 2 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
685. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=-4$ ,  $r=-3$ ,  $l=-2$ ,  $n=3$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
686. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
687. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
688. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-1$ ,  $r=3$ ,  $l=-2$ ,  $n=2$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
689. Given a camera position of  $[-4 -2 3]$ , a gaze vector of  $[3 -5 3]$ , and an up vector of  $[-1 3 3]$ , what is the resulting camera transformation matrix?

690. Project point  $[4\ 2\ -3\ 1]$  onto the plane  $n=2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
691. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=2$ ,  $r=-5$ ,  $l=-4$ ,  $n=-1$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).
692. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
693. Project point  $[-5\ -5\ -5\ 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
694. The \_\_\_\_\_ transformation transforms camera coordinates into clip coordinates.
695. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
696. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-5$ ,  $r=3$ ,  $l=-1$ ,  $n=-5$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
697. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
698. Create a matrix to transform a parallelepiped defined by  $t=-5$ ,  $b=4$ ,  $r=0$ ,  $l=2$ ,  $n=4$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
699. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=-5$ ,  $r=-1$ ,  $l=-3$ ,  $n=1$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
700. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=2$ ,  $r=-3$ ,  $l=1$ ,  $n=-5$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
701. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=3$ ,  $r=1$ ,  $l=0$ ,  $n=-4$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).
702. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
703. Given a camera position of  $[-3\ -3\ 2]$ , a gaze vector of  $[-5\ -1\ 2]$ , and an up vector of  $[3\ -4\ -4]$ , what is the resulting camera transformation matrix?
704. The projection transformation transforms eye space into \_\_\_\_\_ space.
705. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
706. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.

707. Create a matrix to transform a parallelepiped defined by  $t=3$ ,  $b=-5$ ,  $r=3$ ,  $l=-4$ ,  $n=-4$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).
708. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=-5$ ,  $r=-2$ ,  $l=2$ ,  $n=2$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
709. Project point  $[3 \ 4 \ 1 \ 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
710. Project point  $[0 \ -4 \ -1 \ 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
711. Project point  $[-2 \ 0 \ -4 \ 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
712. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
713. Project point  $[0 \ 1 \ -4 \ 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
714. The \_\_\_\_\_ transformation transforms eye space into clip space.
715. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
716. Project point  $[-5 \ 1 \ 4 \ 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
717. Project point  $[-2 \ 1 \ -2 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
718. Create a matrix to transform a parallelepiped defined by  $t=3$ ,  $b=1$ ,  $r=-3$ ,  $l=0$ ,  $n=2$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
719. Project point  $[-3 \ 0 \ -1 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
720. The \_\_\_\_\_ transformation transforms object coordinates into world coordinates.

721. Given a camera position of  $[2\ 3\ -1]$ , a gaze vector of  $[2\ 3\ -2]$ , and an up vector of  $[-5\ -2\ -1]$ , what is the resulting camera transformation matrix?
722. Given a camera position of  $[1\ -2\ -2]$ , a gaze vector of  $[-3\ 2\ 4]$ , and an up vector of  $[-5\ -3\ 1]$ , what is the resulting camera transformation matrix?
723. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
724. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=3$ ,  $r=0$ ,  $l=-4$ ,  $n=-3$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
725. Project point  $[-5\ 0\ 0\ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
726. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
727. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
728. Given a camera position of  $[-2\ -3\ 1]$ , a gaze vector of  $[2\ -4\ 2]$ , and an up vector of  $[-5\ 3\ -2]$ , what is the resulting camera transformation matrix?
729. Project point  $[-5\ -4\ -4\ 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
730. Given a camera position of  $[4\ -2\ 3]$ , a gaze vector of  $[4\ 0\ -2]$ , and an up vector of  $[-4\ 2\ -3]$ , what is the resulting camera transformation matrix?
731. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
732. Project point  $[-1\ 1\ 1\ 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
733. The \_\_\_\_\_ transformation transforms world space into eye space.
734. Given a camera position of  $[-5\ 0\ -1]$ , a gaze vector of  $[3\ 0\ 0]$ , and an up vector of  $[-4\ 3\ 3]$ , what is the resulting camera transformation matrix?
735. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
736. The view transformation transforms world space into \_\_\_\_\_ space.
737. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.

738. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
739. The \_\_\_\_\_ transformation transforms 2d coordinates into screen coordinates.
740. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=1$ ,  $r=1$ ,  $l=-3$ ,  $n=2$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
741. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=0$ ,  $r=4$ ,  $l=-2$ ,  $n=1$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).
742. The projection transformation transforms \_\_\_\_\_ space into clip space.
743. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
744. The camera transformation transforms world coordinates into \_\_\_\_\_ coordinates.
745. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
746. The \_\_\_\_\_ transformation transforms \_\_\_\_\_ space into world space.
747. Project point  $[3\ 1\ -5\ 1]$  onto the plane  $n=-4$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
748. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
749. Project point  $[1\ -1\ -3\ 1]$  onto the plane  $n=-2$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
750. Project point  $[2\ 0\ -4\ 1]$  onto the plane  $n=4$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
751. Project point  $[2\ 0\ -1\ 1]$  onto the plane  $n=-5$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
752. Given a camera position of  $[-5\ -4\ -3]$ , a gaze vector of  $[-2\ -5\ -2]$ , and an up vector of  $[1\ -2\ 0]$ , what is the resulting camera transformation matrix?
753. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=4$ ,  $r=2$ ,  $l=-2$ ,  $n=3$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).

754. Project point  $[0 \ -2 \ -4 \ 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
755. The projection transformation transforms camera space into \_\_\_\_\_ space.
756. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=4$ ,  $r=-2$ ,  $l=1$ ,  $n=4$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
757. Project point  $[-4 \ -2 \ 3 \ 1]$  onto the plane  $n=3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
758. Project point  $[-3 \ 0 \ 2 \ 1]$  onto the plane  $n=-4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
759. Create a matrix to transform a parallelepiped defined by  $t=-5$ ,  $b=-3$ ,  $r=-4$ ,  $l=-2$ ,  $n=0$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
760. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=3$ ,  $r=4$ ,  $l=-1$ ,  $n=-3$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
761. Given a camera position of  $[4 \ -4 \ -3]$ , a gaze vector of  $[-5 \ -5 \ -4]$ , and an up vector of  $[1 \ -1 \ -4]$ , what is the resulting camera transformation matrix?
762. Perspective division transforms \_\_\_\_\_ space into 2d space.
763. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=-3$ ,  $r=3$ ,  $l=4$ ,  $n=-2$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
764. Given a camera position of  $[-5 \ 2 \ 3]$ , a gaze vector of  $[2 \ 2 \ -1]$ , and an up vector of  $[0 \ 1 \ -2]$ , what is the resulting camera transformation matrix?
765. The projection transformation transforms camera coordinates into \_\_\_\_\_ coordinates.
766. Given a camera position of  $[-4 \ 4 \ -5]$ , a gaze vector of  $[0 \ -1 \ 3]$ , and an up vector of  $[-5 \ 0 \ -1]$ , what is the resulting camera transformation matrix?
767. Given a camera position of  $[2 \ -3 \ 2]$ , a gaze vector of  $[-5 \ -4 \ 0]$ , and an up vector of  $[-1 \ 0 \ 3]$ , what is the resulting camera transformation matrix?
768. Project point  $[-5 \ -4 \ -1 \ 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
769. Project point  $[-4 \ -1 \ 4 \ 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?

770. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
771. Given a camera position of  $[-2 -4 0]$ , a gaze vector of  $[1 1 -1]$ , and an up vector of  $[2 2 2]$ , what is the resulting camera transformation matrix?
772. Project point  $[3 -4 0 1]$  onto the plane  $n=4$ .  
 a) What will  $px, py, pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px, py$  be after perspective division?
773. Project point  $[-4 3 1 1]$  onto the plane  $n=-3$ .  
 a) What will  $px, py, pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px, py$  be after perspective division?
774. Given a camera position of  $[-1 -3 -1]$ , a gaze vector of  $[0 -4 1]$ , and an up vector of  $[-3 4 4]$ , what is the resulting camera transformation matrix?
775. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
776. Project point  $[-3 -3 -5 1]$  onto the plane  $n=4$ .  
 a) What will  $px, py, pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px, py$  be after perspective division?
777. The view transformation transforms world coordinates into \_\_\_\_\_ coordinates.
778. Project point  $[3 0 3 1]$  onto the plane  $n=-4$ .  
 a) What will  $px, py, pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px, py$  be after perspective division?
779. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
780. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
781. Create a matrix to transform a parallelepiped defined by  $t=4, b=-5, r=3, l=-3, n=-1$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
782. Create a matrix to transform a parallelepiped defined by  $t=0, b=-1, r=3, l=1, n=-2$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
783. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
784. Create a matrix to transform a parallelepiped defined by  $t=4, b=-4, r=4, l=-2, n=1$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
785. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.

786. Project point  $[4\ 3\ -3\ 1]$  onto the plane  $n=-3$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
787. Perspective division transforms the canonical view volume into \_\_\_\_\_ space.
788. The projection transformation transforms \_\_\_\_\_ space into clip space.
789. The view transformation transforms world coordinates into \_\_\_\_\_ coordinates.
790. Project point  $[-3\ -3\ -4\ 1]$  onto the plane  $n=2$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
791. The view transformation transforms world coordinates into \_\_\_\_\_ coordinates.
792. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=4$ ,  $r=-5$ ,  $l=-2$ ,  $n=4$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
793. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=1$ ,  $r=3$ ,  $l=4$ ,  $n=2$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
794. Given a camera position of  $[-2\ 4\ 0]$ , a gaze vector of  $[-4\ 3\ 4]$ , and an up vector of  $[-4\ 1\ -4]$ , what is the resulting camera transformation matrix?
795. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
796. The \_\_\_\_\_ transformation transforms eye space into the canonical view volume.
797. Project point  $[4\ 2\ 1\ 1]$  onto the plane  $n=-1$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
798. Given a camera position of  $[-4\ 0\ -3]$ , a gaze vector of  $[2\ 2\ 2]$ , and an up vector of  $[0\ 1\ -1]$ , what is the resulting camera transformation matrix?
799. The \_\_\_\_\_ transformation transforms world space into \_\_\_\_\_ space.
800. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
801. The projection transformation transforms \_\_\_\_\_ coordinates into the canonical view volume.
802. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
803. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.



804. Create a matrix to transform a parallelepiped defined by  $t=3$ ,  $b=-4$ ,  $r=-5$ ,  $l=2$ ,  $n=-3$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
805. Create a matrix to transform a parallelepiped defined by  $t=3$ ,  $b=-3$ ,  $r=3$ ,  $l=-2$ ,  $n=-2$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
806. The ----- transformation transforms object space into world space.
807. Project point  $[4 -5 -1 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
808. Given a camera position of  $[4 2 2]$ , a gaze vector of  $[-3 3 -5]$ , and an up vector of  $[2 3 1]$ , what is the resulting camera transformation matrix?
809. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
810. Perspective division transforms clip coordinates into ----- coordinates.
811. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
812. Given a camera position of  $[-5 3 2]$ , a gaze vector of  $[-3 2 -5]$ , and an up vector of  $[0 -2 -5]$ , what is the resulting camera transformation matrix?
813. Given a camera position of  $[-5 3 -4]$ , a gaze vector of  $[3 0 0]$ , and an up vector of  $[-4 3 0]$ , what is the resulting camera transformation matrix?
814. The viewport transformation transforms ----- space into screen space.
815. Project point  $[-3 -3 2 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
816. Project point  $[2 0 2 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
817. The model transformation transforms model space into ----- space.
818. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=1$ ,  $r=-1$ ,  $l=4$ ,  $n=3$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
819. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=0$ ,  $r=3$ ,  $l=2$ ,  $n=-2$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).
820. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=1$ ,  $r=0$ ,  $l=-1$ ,  $n=0$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).

821. Project point  $[-1 \ -4 \ 4 \ 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
822. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=1$ ,  $r=-2$ ,  $l=0$ ,  $n=2$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
823. Create a matrix to transform a parallelepiped defined by  $t=2$ ,  $b=-5$ ,  $r=1$ ,  $l=-2$ ,  $n=-2$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
824. The \_\_\_\_\_ transformation transforms \_\_\_\_\_ space into world space.
825. Project point  $[-3 \ -3 \ -5 \ 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
826. Create a matrix to transform a parallelepiped defined by  $t=3$ ,  $b=-3$ ,  $r=-2$ ,  $l=1$ ,  $n=4$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).
827. Given a camera position of  $[0 \ 1 \ 2]$ , a gaze vector of  $[0 \ -3 \ -5]$ , and an up vector of  $[-2 \ 3 \ 4]$ , what is the resulting camera transformation matrix?
828. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
829. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
830. Create a matrix to transform a parallelepiped defined by  $t=3$ ,  $b=0$ ,  $r=-3$ ,  $l=2$ ,  $n=-5$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).
831. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
832. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=3$ ,  $r=4$ ,  $l=3$ ,  $n=4$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
833. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-4$ ,  $r=-4$ ,  $l=-5$ ,  $n=-3$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
834. Given a camera position of  $[-2 \ -3 \ 1]$ , a gaze vector of  $[-5 \ 2 \ 2]$ , and an up vector of  $[1 \ -1 \ -5]$ , what is the resulting camera transformation matrix?
835. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
836. The \_\_\_\_\_ transformation transforms 2d space into screen space.
837. Project point  $[0 \ 2 \ -3 \ 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?

838. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=0$ ,  $r=-5$ ,  $l=-2$ ,  $n=-3$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).
839. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=-5$ ,  $r=3$ ,  $l=-4$ ,  $n=-3$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
840. The \_\_\_\_\_ transformation transforms camera coordinates into clip coordinates.
841. Given a camera position of  $[1 \ 1 \ 3]$ , a gaze vector of  $[-3 \ -1 \ -5]$ , and an up vector of  $[4 \ 4 \ -2]$ , what is the resulting camera transformation matrix?
842. Create a matrix to transform a parallelepiped defined by  $t=3$ ,  $b=2$ ,  $r=-5$ ,  $l=-1$ ,  $n=-1$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).
843. The model transformation transforms model space into \_\_\_\_\_ space.
844. Perspective division transforms \_\_\_\_\_ coordinates into 2d coordinates.
845. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=0$ ,  $r=-3$ ,  $l=4$ ,  $n=-3$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).
846. The model transformation transforms \_\_\_\_\_ coordinates into world coordinates.
847. Project point  $[-3 \ -4 \ 3 \ 1]$  onto the plane  $n=4$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
848. The view transformation transforms \_\_\_\_\_ space into eye space.
849. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
850. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
851. The \_\_\_\_\_ transformation transforms 2d space into screen space.
852. Project point  $[3 \ 3 \ 1 \ 1]$  onto the plane  $n=4$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
853. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
854. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
855. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
856. The \_\_\_\_\_ transformation transforms camera space into clip space.

857. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
858. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-5$ ,  $r=-2$ ,  $l=-5$ ,  $n=-3$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
859. The projection transformation transforms \_\_\_\_\_ coordinates into the canonical view volume.
860. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
861. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
862. Given a camera position of  $[4\ 3\ 4]$ , a gaze vector of  $[2\ -3\ -2]$ , and an up vector of  $[1\ -5\ 2]$ , what is the resulting camera transformation matrix?
863. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
864. The projection transformation transforms \_\_\_\_\_ coordinates into clip coordinates.
865. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
866. Given a camera position of  $[-3\ -2\ 1]$ , a gaze vector of  $[0\ 3\ 1]$ , and an up vector of  $[-3\ 3\ 0]$ , what is the resulting camera transformation matrix?
867. Perspective division transforms \_\_\_\_\_ coordinates into 2d coordinates.
868. The view transformation transforms world coordinates into \_\_\_\_\_ coordinates.
869. Project point  $[2\ 4\ -1\ 1]$  onto the plane  $n=-1$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
870. Project point  $[2\ 3\ 0\ 1]$  onto the plane  $n=3$ .  
 a) What will  $p_x$ ,  $p_y$ ,  $p_w$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $p_x$ ,  $p_y$  be after perspective division?
871. The view transformation transforms \_\_\_\_\_ space into camera space.
872. Given a camera position of  $[1\ -1\ 4]$ , a gaze vector of  $[-5\ -3\ 3]$ , and an up vector of  $[-5\ -5\ -2]$ , what is the resulting camera transformation matrix?
873. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-2$ ,  $r=-5$ ,  $l=0$ ,  $n=2$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
874. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=-4$ ,  $r=-2$ ,  $l=4$ ,  $n=2$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).

875. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
876. Project point  $[-1 \ 3 \ -5 \ 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
877. Project point  $[-2 \ 2 \ -5 \ 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
878. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors all are in the same projection \*direction\*.
879. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=4$ ,  $r=3$ ,  $l=4$ ,  $n=4$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).
880. Project point  $[-3 \ 4 \ 3 \ 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
881. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
882. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=1$ ,  $r=-5$ ,  $l=1$ ,  $n=1$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).
883. Project point  $[-3 \ -2 \ 4 \ 1]$  onto the plane  $n=3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
884. Project point  $[4 \ 4 \ -1 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
885. Project point  $[-2 \ -5 \ 2 \ 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
886. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
887. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.

888. Project point  $[-1 \ -5 \ 4 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
889. The \_\_\_\_\_ transformation transforms world coordinates into camera coordinates.
890. Given a camera position of  $[-2 \ -2 \ 4]$ , a gaze vector of  $[-1 \ 2 \ -4]$ , and an up vector of  $[-2 \ 1 \ -1]$ , what is the resulting camera transformation matrix?
891. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
892. Given a camera position of  $[0 \ 1 \ -2]$ , a gaze vector of  $[-2 \ 4 \ -4]$ , and an up vector of  $[-5 \ 4 \ -2]$ , what is the resulting camera transformation matrix?
893. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=-2$ ,  $r=-4$ ,  $l=-3$ ,  $n=2$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
894. Given a camera position of  $[-5 \ -3 \ -3]$ , a gaze vector of  $[4 \ 4 \ 1]$ , and an up vector of  $[1 \ 3 \ 4]$ , what is the resulting camera transformation matrix?
895. The viewport transformation transforms 2d space into \_\_\_\_\_ space.
896. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
897. Project point  $[3 \ -3 \ 4 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
898. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
899. Given a camera position of  $[-2 \ -5 \ 0]$ , a gaze vector of  $[1 \ -2 \ -1]$ , and an up vector of  $[4 \ 1 \ -3]$ , what is the resulting camera transformation matrix?
900. The \_\_\_\_\_ transformation transforms clip coordinates into 2d coordinates.
901. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
902. Project point  $[4 \ 3 \ -4 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
903. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-5$ ,  $r=5$ ,  $l=4$ ,  $n=1$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
904. Given a camera position of  $[-1 \ -5 \ -1]$ , a gaze vector of  $[2 \ 2 \ 4]$ , and an up vector of  $[-3 \ -1 \ -3]$ , what is the resulting camera transformation matrix?

905. Given a camera position of  $[-1 -1 3]$ , a gaze vector of  $[-2 -2 3]$ , and an up vector of  $[2 3 1]$ , what is the resulting camera transformation matrix?
906. The viewport transformation transforms \_\_\_\_\_ coordinates into screen coordinates.
907. The projection transformation transforms eye space into \_\_\_\_\_ space.
908. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
909. Given a camera position of  $[-5 1 3]$ , a gaze vector of  $[-5 1 2]$ , and an up vector of  $[3 1 4]$ , what is the resulting camera transformation matrix?
910. Create a matrix to transform a parallelepiped defined by  $t=1$ ,  $b=-5$ ,  $r=-3$ ,  $l=-5$ ,  $n=0$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
911. Create a matrix to transform a parallelepiped defined by  $t=3$ ,  $b=2$ ,  $r=-2$ ,  $l=3$ ,  $n=-1$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
912. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
913. Project point  $[-2 1 3 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
914. Given a camera position of  $[-3 3 -3]$ , a gaze vector of  $[-4 -5 -5]$ , and an up vector of  $[0 4 1]$ , what is the resulting camera transformation matrix?
915. The \_\_\_\_\_ transformation transforms 2d coordinates into screen coordinates.
916. Project point  $[1 0 0 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
917. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=3$ ,  $r=1$ ,  $l=0$ ,  $n=-2$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).
918. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
919. Given a camera position of  $[-3 -3 -1]$ , a gaze vector of  $[-3 0 -5]$ , and an up vector of  $[-4 2 2]$ , what is the resulting camera transformation matrix?
920. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
921. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=-2$ ,  $r=-2$ ,  $l=-1$ ,  $n=1$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).
922. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=3$ ,  $r=-2$ ,  $l=-5$ ,  $n=3$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).

923. Project point  $[-4 -2 3 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
924. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=-5$ ,  $r=0$ ,  $l=-2$ ,  $n=2$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).
925. Project point  $[-4 0 3 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
926. Create a matrix to transform a parallelepiped defined by  $t=-5$ ,  $b=2$ ,  $r=2$ ,  $l=0$ ,  $n=0$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
927. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
928. Project point  $[2 1 -3 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
929. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Looks more natural.
930. The viewport transformation transforms \_\_\_\_\_ space into screen space.
931. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
932. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=3$ ,  $r=1$ ,  $l=0$ ,  $n=-2$ , and  $f=3$  into the canonical view volume (an orthographic projection matrix).
933. The \_\_\_\_\_ transformation transforms clip coordinates into 2d coordinates.
934. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
935. Perspective division transforms \_\_\_\_\_ space into 2d space.
936. Project point  $[-5 -2 1 1]$  onto the plane  $n=3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
937. Create a matrix to transform a parallelepiped defined by  $t=3$ ,  $b=-1$ ,  $r=-3$ ,  $l=3$ ,  $n=-1$ , and  $f=-3$  into the canonical view volume (an orthographic projection matrix).
938. Project point  $[0 0 -5 1]$  onto the plane  $n=3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?



939. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=-3$ ,  $r=-4$ ,  $l=-5$ ,  $n=-5$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
940. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Useful for architectural drawings.
941. The viewport transformation transforms 2d coordinates into \_\_\_\_\_ coordinates.
942. The viewport transformation transforms 2d space into \_\_\_\_\_ space.
943. Given a camera position of  $[4 \ 3 \ 1]$ , a gaze vector of  $[-1 \ -4 \ -2]$ , and an up vector of  $[3 \ 1 \ 1]$ , what is the resulting camera transformation matrix?
944. The \_\_\_\_\_ transformation transforms 2d coordinates into screen coordinates.
945. The viewport transformation transforms \_\_\_\_\_ coordinates into screen coordinates.
946. Project point  $[-3 \ 0 \ -1 \ 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
947. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
948. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
949. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.
950. Create a matrix to transform a parallelepiped defined by  $t=0$ ,  $b=1$ ,  $r=-3$ ,  $l=-4$ ,  $n=1$ , and  $f=-4$  into the canonical view volume (an orthographic projection matrix).
951. Project point  $[-4 \ 2 \ 3 \ 1]$  onto the plane  $n=2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
952. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=0$ ,  $r=4$ ,  $l=1$ ,  $n=-3$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).
953. Given a camera position of  $[3 \ 2 \ -4]$ , a gaze vector of  $[-1 \ -1 \ 2]$ , and an up vector of  $[0 \ -1 \ -3]$ , what is the resulting camera transformation matrix?
954. Project point  $[0 \ -3 \ -5 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
955. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.

956. Create a matrix to transform a parallelepiped defined by  $t=-3$ ,  $b=-2$ ,  $r=4$ ,  $l=-3$ ,  $n=-2$ , and  $f=-5$  into the canonical view volume (an orthographic projection matrix).
957. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
958. Given a camera position of  $[4 \ 1 \ 1]$ , a gaze vector of  $[0 \ 4 \ -1]$ , and an up vector of  $[3 \ -3 \ 0]$ , what is the resulting camera transformation matrix?
959. Create a matrix to transform a parallelepiped defined by  $t=-5$ ,  $b=1$ ,  $r=-2$ ,  $l=0$ ,  $n=-2$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
960. Given a camera position of  $[1 \ 3 \ -3]$ , a gaze vector of  $[0 \ -4 \ -2]$ , and an up vector of  $[-5 \ 0 \ -4]$ , what is the resulting camera transformation matrix?
961. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a frustum.
962. Given a camera position of  $[3 \ 2 \ -1]$ , a gaze vector of  $[4 \ -2 \ 4]$ , and an up vector of  $[3 \ 0 \ -4]$ , what is the resulting camera transformation matrix?
963. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Further objects are smaller.
964. Given a camera position of  $[4 \ -1 \ 4]$ , a gaze vector of  $[-1 \ -3 \ 1]$ , and an up vector of  $[-4 \ -2 \ 4]$ , what is the resulting camera transformation matrix?
965. Project point  $[1 \ 4 \ 3 \ 1]$  onto the plane  $n=1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
966. Given a camera position of  $[-4 \ 2 \ 1]$ , a gaze vector of  $[1 \ 2 \ -1]$ , and an up vector of  $[-2 \ 1 \ 3]$ , what is the resulting camera transformation matrix?
967. Given a camera position of  $[2 \ 0 \ 4]$ , a gaze vector of  $[3 \ 2 \ 3]$ , and an up vector of  $[2 \ -5 \ -2]$ , what is the resulting camera transformation matrix?
968. Create a matrix to transform a parallelepiped defined by  $t=4$ ,  $b=3$ ,  $r=4$ ,  $l=-5$ ,  $n=-3$ , and  $f=-1$  into the canonical view volume (an orthographic projection matrix).
969. Project point  $[-4 \ -5 \ 4 \ 1]$  onto the plane  $n=4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
970. Given a camera position of  $[2 \ 1 \ 4]$ , a gaze vector of  $[4 \ 0 \ 2]$ , and an up vector of  $[2 \ 2 \ 4]$ , what is the resulting camera transformation matrix?
971. Given a camera position of  $[-2 \ -1 \ -3]$ , a gaze vector of  $[-3 \ 3 \ 3]$ , and an up vector of  $[0 \ 1 \ 3]$ , what is the resulting camera transformation matrix?
972. Create a matrix to transform a parallelepiped defined by  $t=-4$ ,  $b=-2$ ,  $r=-5$ ,  $l=2$ ,  $n=-1$ , and  $f=-2$  into the canonical view volume (an orthographic projection matrix).

973. The model transformation transforms model space into \_\_\_\_\_ space.
974. Create a matrix to transform a parallelepiped defined by  $t=5$ ,  $b=4$ ,  $r=4$ ,  $l=3$ ,  $n=-5$ , and  $f=0$  into the canonical view volume (an orthographic projection matrix).
975. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
976. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Parallel lines are preserved.
977. Given a camera position of  $[0 \ 0 \ -3]$ , a gaze vector of  $[-1 \ -5 \ -2]$ , and an up vector of  $[-5 \ -1 \ 0]$ , what is the resulting camera transformation matrix?
978. The \_\_\_\_\_ transformation transforms 2d coordinates into screen coordinates.
979. Create a matrix to transform a parallelepiped defined by  $t=-2$ ,  $b=-1$ ,  $r=-5$ ,  $l=-1$ ,  $n=4$ , and  $f=1$  into the canonical view volume (an orthographic projection matrix).
980. Project point  $[0 \ 0 \ -5 \ 1]$  onto the plane  $n=-5$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
981. Project point  $[-3 \ -4 \ 0 \ 1]$  onto the plane  $n=2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
982. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Projectors pass through a \*viewpoint\*.
983. Project point  $[-5 \ 4 \ 2 \ 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
984. Given a camera position of  $[-2 \ -4 \ 2]$ , a gaze vector of  $[3 \ -5 \ 2]$ , and an up vector of  $[-2 \ -3 \ -2]$ , what is the resulting camera transformation matrix?
985. Given a camera position of  $[-4 \ -5 \ 3]$ , a gaze vector of  $[0 \ 1 \ 4]$ , and an up vector of  $[-5 \ -5 \ -4]$ , what is the resulting camera transformation matrix?
986. Project point  $[1 \ -1 \ -4 \ 1]$  onto the plane  $n=-3$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
987. The \_\_\_\_\_ transformation transforms 2d coordinates into screen coordinates.
988. For which kind of projection is the following statement true? Answer 'p' for perspective or 'o' for orthographic. Viewing volume is shaped like a parallelepiped.

989. Project point  $[1 \ -4 \ -1 \ 1]$  onto the plane  $n=-1$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
990. Create a matrix to transform a parallelepiped defined by  $t=-1$ ,  $b=4$ ,  $r=2$ ,  $l=-1$ ,  $n=3$ , and  $f=4$  into the canonical view volume (an orthographic projection matrix).
991. Create a matrix to transform a parallelepiped defined by  $t=-5$ ,  $b=4$ ,  $r=-1$ ,  $l=-2$ ,  $n=4$ , and  $f=2$  into the canonical view volume (an orthographic projection matrix).
992. Given a camera position of  $[4 \ -2 \ -4]$ , a gaze vector of  $[-3 \ -4 \ -2]$ , and an up vector of  $[4 \ -2 \ -3]$ , what is the resulting camera transformation matrix?
993. Perspective division transforms \_\_\_\_\_ space into 2d space.
994. Project point  $[-4 \ 2 \ -2 \ 1]$  onto the plane  $n=-2$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
995. Project point  $[1 \ 4 \ 1 \ 1]$  onto the plane  $n=-4$ .  
 a) What will  $px$ ,  $py$ ,  $pw$  be after the perspective transformation is applied? (before the scaling and translation of the orthographic transformation)  
 b) What will  $px$ ,  $py$  be after perspective division?
996. Given a camera position of  $[-2 \ 1 \ 0]$ , a gaze vector of  $[0 \ -2 \ -2]$ , and an up vector of  $[0 \ 4 \ -2]$ , what is the resulting camera transformation matrix?
997. Given a camera position of  $[-2 \ -1 \ 4]$ , a gaze vector of  $[2 \ -4 \ 1]$ , and an up vector of  $[3 \ -1 \ -5]$ , what is the resulting camera transformation matrix?
998. Given a camera position of  $[-1 \ -5 \ 2]$ , a gaze vector of  $[1 \ -1 \ -3]$ , and an up vector of  $[1 \ 0 \ 1]$ , what is the resulting camera transformation matrix?
999. The view transformation transforms \_\_\_\_\_ space into eye space.
1000. Given a camera position of  $[-5 \ 4 \ -4]$ , a gaze vector of  $[-3 \ 0 \ -2]$ , and an up vector of  $[1 \ 3 \ 3]$ , what is the resulting camera transformation matrix?