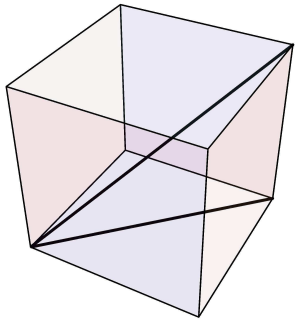
MTH 255H **HW #1** Winter 2019

1. Determine the angle between the diagonal of a cube and the diagonal of one of its faces, as shown in the adjacent figure.



2. Which pairs (if any) of vectors from the following list

(a) Are perpendicular?

(b) Are parallel?

(c) Have an angle less than $\pi/2$ between them?

(d) Have an angle of more than $\pi/2$ between them?

Briefly justify your results.

$$\vec{\boldsymbol{a}} = \hat{\boldsymbol{x}} - 3\hat{\boldsymbol{y}} - \hat{\boldsymbol{z}} \qquad \vec{\boldsymbol{b}} = \hat{\boldsymbol{x}} + \hat{\boldsymbol{y}} + 2\hat{\boldsymbol{z}}$$
$$\vec{\boldsymbol{c}} = -2\hat{\boldsymbol{x}} - \hat{\boldsymbol{y}} + \hat{\boldsymbol{z}} \qquad \vec{\boldsymbol{d}} = -\hat{\boldsymbol{x}} - \hat{\boldsymbol{y}} + \hat{\boldsymbol{z}}$$