Question 1

OpenMPI successfully installed.

Question 2

```
openmpi-2.0.4 — -bash — 133×42
[Matts-MacBook-Pro:openmpi-2.0.4 MattTaylor$ hostname
Matts-MacBook-Pro.local
[Matts-MacBook-Pro:openmpi-2.0.4 MattTaylor$ $HOME/opt/usr/local/bin/mpicc --version
Configured with: --prefix=/Applications/Xcode.app/Contents/Developer/usr --with-gxx-include-dir=/Applications/Xcode.app/Contents/Deve
loper/Platforms/MacOSX.platform/Developer/SDKs/MacOSX10.14.sdk/usr/include/c++/4.2.1
Apple LLVM version 10.0.1 (clang-1001.0.46.4)
Target: x86_64-apple-darwin18.2.0
Thread model: posix
InstalledDir: /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/bin
[Matts-MacBook-Pro:openmpi-2.0.4 MattTaylor$ $HOME/opt/usr/local/bin/mpirun --version
mpirun (Open MPI) 2.0.4

Report bugs to http://www.open-mpi.org/community/help/
Matts-MacBook-Pro:openmpi-2.0.4 MattTaylor$
```

Question 3

```c
Cdegrees_to_F.c

1   #include <mpi.h>
2   #include <stdio.h>
3
4   int main(int argc, char** argv) {
5       MPI_Init(NULL, NULL);
6       int rank;
7       int size;
8       int degrees_F;
9       MPI_Comm_rank(MPI_COMM_WORLD, &rank);
10      MPI_Comm_size(MPI_COMM_WORLD, &size);
11      degrees_F = rank*(9/5) + 32;
12      printf("Degrees in C: %d, Degrees in F %d\n",rank, degrees_F);
13      MPI_Finalize();
14  }
```

```
[Matts-MacBook-Pro:openmpi-2.0.4 MattTaylor$ $HOME/opt/usr/local/bin/mpicc -o Cdegrees_to_F ./Cdegrees_to_F.c
[Matts-MacBook-Pro:openmpi-2.0.4 MattTaylor$ $HOME/opt/usr/local/bin/mpirun -np 2 ./Cdegrees_to_F
Degrees in C: 0, Degrees in F 32
Degrees in C: 1, Degrees in F 33
Matts-MacBook-Pro:openmpi-2.0.4 MattTaylor$
```

Question 4

```c
#include <mpi.h>
#include <stdio.h>

int main(int argc, char** argv) {
    MPI_Init(NULL, NULL);
    int rank;
    int size;
    int degrees_F;
    int i;
    int n;
    double *vec0, *vec1;
    double dot_product;
    MPI_Comm_rank(MPI_COMM_WORLD, &rank);
    MPI_Comm_size(MPI_COMM_WORLD, &size);
    for(i = 0; i < n)
        dot_product+= vec0[i]*vec1[i];
    MPI_Finalize();
}
```

Question 5

The first version of MPI was version 1.3 (MPI-1). This emphasises message passing and has a static runtime environment. MPI-2.2 (MPI-2) brought on new features like I/O, dynamic process management, and remote memory operations. MPI-3.1 (MPI-3) has extensions to the collective operations with non-blocking versions and extensions to one-sided operations. MPI-3 also includes new Fortran 2008 bindings.