qroundNEWTON — componentwise rounding of quaternion arrays

Round quaternion components to improve readability (for logs, tables, diagnostics).

Setup

```
hasQuat = true;
try
    quaternion(0,0,0,0);
catch
    hasQuat = false;
end
if ~hasQuat
    disp('This toolbox requires MATLAB''s built-in quaternion class
(quaternion(w,x,y,z)).');
    disp('Examples in this page are skipped.');
    return;
end

if exist('qroundNEWTON','file') ~= 2
    thisFile = mfilename('fullpath');
    if ~isempty(thisFile)
        rootGuess = fileparts(fileparts(fileparts(thisFile))); % .../docs/source ->
toolbox root
        if exist(fullfile(rootGuess,'qroundNEWTON.m'),'file')
            addpath(rootGuess);
            rehash toolboxcache
        end
    end
end

if exist('qroundNEWTON','file') ~= 2
    error('qroundNEWTON not found on the MATLAB path. Add the toolbox root
folder.');
end
```

Syntax

- `Y = qroundNEWTON(X)`
- `Y = qroundNEWTON(X, ndigits)`

Example 1: a single quaternion

```
q  = quaternion(1.234567, -0.0001234, 2, -3.1415926);
q2 = qroundNEWTON(q, 3);

disp('Before:'); disp(q);
```

```
Before:
        1.2346 - 0.0001234i +         2j -    3.1416k
```

```
disp('After (ndigits=3):'); disp(q2);
```

```
After (ndigits=3):
     1.235 +     0i +     2j - 3.142k
```

Example 2: a matrix

```
rng(2);
A  = quaternion(randn(3),randn(3),randn(3),randn(3));
A2 = qroundNEWTON(A, 2);

disp('A (original):'); disp(A);
```

```
A (original):
     -0.12423 -  0.82845i +  0.66096j -     1.63k     -0.19598 -   1.1221i -   1.0163j - 0.084647k      -1.1289 +  0
      -2.5415 +  0.53584i -   2.5455j -  0.93638k     -0.19621 + 0.046042i -  0.11557j -  0.88367k      0.19425 +
      0.27721 +  0.10947i + 0.012487j -  0.27864k     -0.30573 -   1.2386i -  0.77633j +  0.51178k     -0.60707 - 0
```

```
disp('A2 (rounded to 2 digits):'); disp(A2);
```

```
A2 (rounded to 2 digits):
    -0.12 - 0.83i + 0.66j - 1.63k     -0.2 - 1.12i - 1.02j - 0.08k    -1.13 + 0.64i - 1.14j - 0.07k
    -2.54 + 0.54i - 2.55j - 0.94k     -0.2 + 0.05i - 0.12j - 0.88k     0.19 + 1.15i + 0.32j + 0.02k
     0.28 + 0.11i + 0.01j - 0.28k    -0.31 - 1.24i - 0.78j + 0.51k    -0.61 - 0.02i - 0.57j - 0.39k
```

See also

qcleanNEWTON, parts