

1. $A.^2 = [1\ 4;\ 9\ 16]$ $A^2 = [7\ 10;\ 15\ 22]$
2. $A * B = [4\ -4;\ 4\ 15]$ $A * B = [-4\ -2;\ 13\ 17]$
3. $v = 1 : 3$ $v = 1\ 2\ 3$ $D = \text{diag}(v)$ $D = [1\ 0\ 0;\ 0\ 2\ 0;\ 0\ 0\ 3]$ $E = \text{exp}(D)$
 $E = [2.7183\ 1.0000\ 1.0000;\ 1.0000\ 7.3891\ 1.0000;\ 1.0000\ 1.0000\ 20.0855]$
Off the diagonal, $e^0 = 1$, so each entry is a 1. On the diagonal $e^1 = 2.7183$, $e^2 = 7.3891$, and $e^3 = 20.0855$.
4. $n = 20; n * (n + 1) * (2 * n + 1) / 6$ $\text{ans} = 2870$
5. $x = \text{linspace}(0, 10, 20); x(1 : 2 : \text{end}) = 0;$
6. $w = 5 : 27; \text{length}(w)$ $\text{ans} = 23$, $x = 1 : 0.01 : 5; \text{length}(x)$ $\text{ans} = 401$, $y = 2 : 0.005 : 3; \text{length}(y)$ $\text{ans} = 201$, $z = (100 : 0.5 : 200)'; \text{length}(z)$ $\text{ans} = 201$
7. $x = 2 : 2 : 1000; \text{sum}(x)$ $\text{ans} = 250500$
8. $\text{sum}((1 : 20).^2)$ $\text{ans} = 2870$
9. $v.^3$ $\text{ans} = 27\ 64\ 125\ 216\ 343$, v^3 cannot be executed as matrix dimensions must agree.
10. $A(1, :) = 20 : 23$ $A = [20\ 21\ 22\ 23;\ 5\ -1\ 0\ 0;\ 3\ -2\ 5\ 0]$

 $A(:, 2) = 11$ $A = [20\ 11\ 22\ 23;\ 5\ 11\ 0\ 0;\ 3\ 11\ 5\ 0]$

 $A(5, 5) = 777$ $A = [20\ 11\ 22\ 23\ 0;\ 5\ 11\ 0\ 0\ 0;\ 3\ 11\ 5\ 0\ 0;\ 0\ 0\ 0\ 0\ 0;\ 0\ 0\ 0\ 0\ 777]$
11. $A = \text{ones}(2, 3)$ $A = [1\ 1\ 1;\ 1\ 1\ 1]$
 $C = [A; A]$ $C = [1\ 1\ 1;\ 1\ 1\ 1;\ 1\ 1\ 1;\ 1\ 1\ 1]$
 $D = \text{zeros}(2, 3)$ $D = [0\ 0\ 0;\ 0\ 0\ 0]$
 $E = [A\ D; D\ A]$ $E = [1\ 1\ 1\ 0\ 0\ 0;\ 1\ 1\ 1\ 0\ 0\ 0;\ 0\ 0\ 1\ 1\ 1;\ 0\ 0\ 0\ 1\ 1\ 1]$
12. $v = (1 : 5)'; w = (2 : 6)'; v.' * w$ $\text{ans} = 70$
13. $A = \text{ones}(2); B = 2 * \text{ones}(3); C = 3 * \text{ones}(2);$
 $D = [A, \text{zeros}(2, 3), \text{zeros}(2, 2); \text{zeros}(3, 2), B, \text{zeros}(3, 2); \text{zeros}(2, 2), \text{zeros}(2, 3), C]$