



Name _____ Class _____ Date _____

AFTER THIS WORKSHEET YOU CAN

- ✓ Find eigenvalues of diagonal and triangular matrices. ✓ Use the characteristic equation.
- ✓ Relate the trace to the sum of eigenvalues. ✓ Relate the determinant to the product of eigenvalues.

 Section A · Concept Check • BEGINNER $4 \times 1 = 4$ _____

- 1** The eigenvalues of $\begin{bmatrix} 7 & 0 \\ 0 & 1 \end{bmatrix}$ are:
☐ A. 7 and 1 ☐ B. 0 and 0 ☐ C. 8 ☐ D. 7 only
- 2** The trace and determinant of $\begin{bmatrix} 5 & 2 \\ 2 & 5 \end{bmatrix}$ are:
☐ A. trace 10, det 21 ☐ B. trace 7, det 25
☐ C. trace 10, det 25 ☐ D. trace 21, det 10
- 3** From $\lambda^2 - 10\lambda + 21 = 0$, the eigenvalues of $\begin{bmatrix} 5 & 2 \\ 2 & 5 \end{bmatrix}$ are:
☐ A. 3 and 7 ☐ B. 5 and 5 ☐ C. 2 and 5
☐ D. 10 and 21
- 4** The eigenvalues of the upper-triangular $\begin{bmatrix} 2 & 1 \\ 0 & 2 \end{bmatrix}$ are:
☐ A. 2 and 2 ☐ B. 2 and 1 ☐ C. 0 and 2
☐ D. 3 and 1

 Section B · Problem Solving • INTERMEDIATE $2 + 3 \times 3 = 11$ _____

- 5** The eigenvalues of a diagonal matrix are its _____ entries.
- 6** The sum of the eigenvalues equals the _____
- 7** Find the eigenvalues of $\begin{bmatrix} 7 & 0 \\ 0 & 1 \end{bmatrix}$.

- 8** Find the trace and determinant of $\begin{bmatrix} 5 & 2 \\ 2 & 5 \end{bmatrix}$.

- 9** Using the previous result, find the eigenvalues.

 Section C · Challenge • CHALLENGE 5 _____

- 10** Find the eigenvalues of $\begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$ (upper triangular).

 Reflection — the most useful thing I learned: _____
A ___/4 B ___/11 C ___/5 **Total ___/20**

Teacher's Signature _____

Parent's Signature _____

✂ ANSWER KEY — FOLD OR CUT BEFORE HANDING OUT

1-A 2-A 3-A 4-A | 5 diagonal 6 trace 7 = 7 and 1 8 = Trace 10, Determinant 21 9 = $\lambda =$
 3 or 7 | 10 = 2 and 2 (repeated)

