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| --- | --- | --- | --- | --- | --- | --- |
| Name: | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | Date: *\_\_\_\_\_\_\_\_\_\_\_* |
| C:\Users\E4092707\Pictures\baldivis logo.png | **Year 11 Mathematics: Applications**  **Investigation 2, 2018**  **Topic – Matrices**  **In Class Component** | | | | | 30  = % |
| **Total Time:** | ***45*** *minutes* | |  | | | |
| **Reading Time:** | *5**minutes* | |
| **Working Time:** | *40**minutes* | |
| **Equipment:** | *SCSA Formula sheets, CAS calculator, Take Home Component* | | | | | |
|  | | | | | | |
| **Date out:** | | *Week \_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_* | | **Date Due:** | *Week \_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_* | |
| **Take home component weighting:** | | *2.5% of the year* | | **In-class component weighting:** | *5% of the semester* | |
| **AIM:** *In this assessment, you will be investigating how matrices are used in real world settings. You can use your TI-Nspire CAS for this investigation, in particular the matrices function.* | | | | | | |

**[Scenario 1: 16 marks]** The following statistics show a tally for the top 10

AFL kicks, taken from the 2017 seasons AFL results. The Coleman Medal is awarded yearly, to

the AFL player, who kicks the most goals, in both home-and-away matches during that year.

This data has been taken from two rounds only.



**1. [2 marks]**

Use the information on AFL kicking statistics to create a 10 x 2 matrix in the space provided and call it Matrix R2.

**Matrix R2 =**

**2. [1 mark]**

Given that a goal is worth 6 points and a behind is worth 1 point, create a 2 x 1 matrix and call it Matrix P.

**Matrix P =**

**3. [2 marks]**

Using the matrices above complete a matrix operation that would give you a resulting matrix that lists the current totals for the top 10 AFL players for 2017. Call this Matrix T.

**4. [5 marks: 2, 3]**

If the following results were to happen for round 3, the number of behinds Josh Kennedy scored is unknown so we have represented it with variable X, create a 10 x 2 matrix for these results and call it Matrix R3 then perform the following matrix operation R2 + R3

**Players Name Team Goals Behinds**

|  |  |  |  |
| --- | --- | --- | --- |
| [Joshua Kennedy](http://www.footywire.com/afl/footy/pp-west-coast-eagles--joshua-kennedy) | [West Coast](http://www.footywire.com/afl/footy/th-west-coast-eagles) | 2 | X |
| [Taylor Walker](http://www.footywire.com/afl/footy/pp-adelaide-crows--taylor-walker) | [Adelaide](http://www.footywire.com/afl/footy/th-adelaide-crows) | 3 | 2 |
| [Josh Bruce](http://www.footywire.com/afl/footy/pp-st-kilda-saints--josh-bruce) | [St Kilda](http://www.footywire.com/afl/footy/th-st-kilda-saints) | 4 | 1 |
| [Luke Breust](http://www.footywire.com/afl/footy/pp-hawthorn-hawks--luke-breust) | [Hawthorn](http://www.footywire.com/afl/footy/th-hawthorn-hawks) | 6 | 5 |
| [Jarrad Waite](http://www.footywire.com/afl/footy/pp-kangaroos--jarrad-waite) | [North Melbourne](http://www.footywire.com/afl/footy/th-kangaroos) | 2 | 1 |
| [Jamie Cripps](http://www.footywire.com/afl/footy/pp-west-coast-eagles--jamie-cripps) | [West Coast](http://www.footywire.com/afl/footy/th-west-coast-eagles) | 3 | 2 |
| [Matthew Pavlich](http://www.footywire.com/afl/footy/pp-fremantle-dockers--matthew-pavlich) | [Fremantle](http://www.footywire.com/afl/footy/th-fremantle-dockers) | 2 | 1 |
| [Cameron McCarthy](http://www.footywire.com/afl/footy/pp-greater-western-sydney-giants--cameron-mccarthy) | [GWS](http://www.footywire.com/afl/footy/th-greater-western-sydney-giants) | 3 | 1 |
| [Shaun Higgins](http://www.footywire.com/afl/footy/pp-kangaroos--shaun-higgins) | [North Melbourne](http://www.footywire.com/afl/footy/th-kangaroos) | 2 | 2 |
| [Jack Riewoldt](http://www.footywire.com/afl/footy/pp-richmond-tigers--jack-riewoldt) | [Richmond](http://www.footywire.com/afl/footy/th-richmond-tigers) | 1 | 3 |
|  |  |  |  |

**Matrix R3 =**

**R2 + R3 =**

**5. [4 marks]**

**C**alculate the new total score for each player and show the matrix operation.

**6. [2 marks]**

Work out what number of behinds Josh Kennedy of the West Coast Eagles, would have to score, in order to remain in the lead as the highest point scorer and explain your answer.

**[Scenario 2: 14 marks]** A financial planner was asked to set up a share portfolio for 3 different clients involving 3 different companies, the information has been entered into matrix A below.

Company 1

Company 3

Company 2

Client C

Client B

Client A

**A =**

In 2015 the shares were each worth

**B1 =**

Company 3

Company 1

Company 2

In 2018 the shares are now worth

**B2 =**

Company 3

Company 2

Company 1

**7.** Use matrix multiplication to determine the value of each client’s portfolio in 2015 and 2018

[4 marks]

**8.** Consider the matrix operations:  and

a) Which of these operations is possible and why? [ 2 marks]

b) If we called the output matrix of **,** Find matrix C andexplain the element in C31 in relation to scenario 2. [ 4 marks]

b) Find matrix M using the correct operations from (a) and explain the findings. [4 marks]