2practice2012

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The University of Sydney
School of Mathematics & Statistics
MATH1902 Practice for Quiz 2.

Family Name : .....

Other Names : .....

Day/time/room : .....

Signature : .....

The real quiz (15 questions) lasts 40 minutes and tests material covered in Exercises for Weeks 7, 8 and 9.

These practice questions should take about 20 to 30 minutes and are similar to the first eight questions of the real quiz.

Calculators are permitted but not needed.

Use a blue or black pen.

Marks are awarded only for what is written in the answer boxes. Your working is not marked.

Answer Box for Question 1	*Answer Box for Question 2*

Answer Box for Question 3	*Answer Box for Question 4*	*Answer Box for Question 5*

Answer Box for Question 6	*Answer Box for Question 7*	*Answer Box for Question 8*

Questions 9, 10, 11, 12, 13, 14, 15 on the real quiz will be multiple choice.

PRACTICE QUESTIONS FOR MATH1902 QUIZ 2

When you have finished, write your answers into the answer boxes on the front. Take care when transcribing your answers. Note that your working will NOT be marked. Use any blank spaces for rough working. Your answers should be exact, using surds if necessary. Do not make numerical approximations using your calculator.

1. Evaluate the matrix product AB where

$$A = \begin{bmatrix} 4 & 5 & -1 \end{bmatrix} \qquad \text{and} \qquad B = \begin{bmatrix} 2 & 1 \\ -1 & 1 \\ 3 & 4 \end{bmatrix} .$$

2. Find a unit vector pointing in the direction of the line with Cartesian equations

$$x - 2 \;=\; y \;=\; \frac{z+3}{-2} .$$

3. Find a unit vector perpendicular to the plane with Cartesian equation

$$2x - y + 2z \;=\; -3 .$$

4. Find a Cartesian equation of the plane containing

$$P(2, 0, -3) , \quad Q(1, -1, 6) \quad \text{and} \quad R(5, 5, 0) .$$

5. Find the intersection point, if it exists, of the lines

$$\mathbf{r} \;=\; 2\mathbf{i} + 3\mathbf{j} - \mathbf{k} + t(\mathbf{i} - \mathbf{j} + 4\mathbf{k}) \qquad \text{and} \qquad \frac{x}{2} \;=\; \frac{y+3}{2} \;=\; z - 5 .$$

6. Find the value of λ such that the following system is inconsistent:

$$\begin{array}{rcrcrcr} x & & & - & 3z & = & -3 \\ -2x & - & \lambda y & + & z & = & 2 \\ x & + & 2y & + & \lambda z & = & 1 \end{array}$$

7. Find the distance from the point $P(0, 1, -2)$ to the plane $3x - 6y + z = 2$.

8. Find the point on the plane $3x - 6y + z = 2$ that is closest to the point $P(0, 1, -2)$.