Essentials Mathematics
Unit 3
Semester 1 2017

Investigation #1

Angles in Mining

Baldivis Secondary College

SOLUTIONS

Time Allowed:
(AT HOME) Minimum 4 nights or 1 weekend,
(IN CLASS) 50 minutes

Marks: HOME: / 15

IN CLASS: / 25

***** START OF AT HOME SECTION*****

Mining is an integral part of the Western Australian economy. There are two types of mining, underground mining and above ground mining.

Review the fact sheets about Ranger 3 Deeps at the following web address:
http://www.energyres.com.au/operations/reserves-resources/ranger-3-deeps/

Answer the following questions about the project:

1. When was the decision made that the project should **not** proceed to Final Feasibility Study in the current operating environment?

(one mark)

June 2015

2. How much did the prefeasibility study that was undertaken into the Ranger 3 Deeps project cost? (give the answer to the nearest ten million Australian Dollars)

(one mark)

$57million Australian Dollars

$60million

Using the information provided in the Draft Environmental Impact Study (EIS) fact Sheets, answer the following questions about the project:

3. The Ranger mine operated from August 1981 to November 2012. How many years was the mine operational? (Give the answer to the nearest half year.)

(one mark)

3months

2012
1981
31 yrs & 3months

31yrs

4. During this time, ERA (Energy Resources Australia) produced from Ranger Mine over 110 000 tonnes of product for use in overseas nuclear power stations. How many tonnes of product were produced each year? (Give your answer to the nearest hundred tonnes.)

110,000 ÷ 31 = 3548.39 tonnes (one mark)

= 3500 tonnes

5. Using information in Chapter 3 of the Environmental Impact Study: "The Project underground mine", describe where the underground uranium ore body is located.

East of Pit 3 (one mark)

6. How far below the surface will most of the mining activity occur?

Between 200-500m (one mark)

7. How many mega tonnes (Mt) of uranium ore are being proposed to be removed?

6.8Mt. (one mark)

8. How many tonnes is this?

6.8 million tonnes (one mark)

6 800 000 tonnes

9. According to the document, 0.27% of the rock removed will be viable product (U_3O_8). What mass of product will be produced from the total amount of ore (question 7)? Give the answer to the nearest tonne and show all your working.

(three marks)

0.27% of 6.8mt =
6800000

~~18360~~ tonnes.

18,360

10. An additional 0.6Mt of low grade ore and 0.5 Mt of waste rock will also be removed. What is the total amount of ore that will be removed from the ground? Give you answer to the nearest 0.1Mt.

(two marks)

$6.8 + 0.6 + 0.5$.

7.9 Mtonnes

11. What is the percentage of waste ore that will be removed?

(two marks)

$\frac{0.5}{7.9} \times 100 = 6.33\%$

****** END OF THIS SECTION******