



2019 TRAINING WORKSHOP NO.3
MATHEMATICS



GRADES 10-12



education

Department:

Education

PROVINCE OF KWAZULU-NATAL

FET

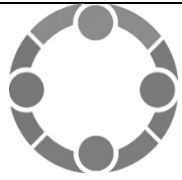
Just-in-Time Training Workshop

2019: No. 3

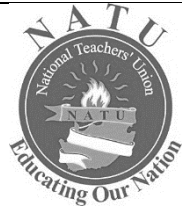
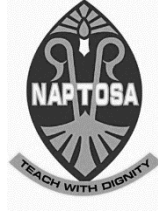
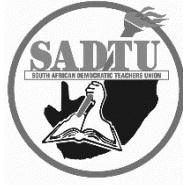
**Pre/post - workshop
activity: MEMO**

Mathematics

Endorsed by:



Jika iMfundo
what I do matters



FET MATHS: JIT Workshop 3 of 2019

SOLUTIONS TO PRE-WORKSHOP ACTIVITY

QUESTION ONE:

Area of semi-circle: $\frac{1}{2}\pi r^2$

$\hat{R} = 90^\circ$ (< in semi - circle) ✓

Diameter = $\sqrt{p^2 + q^2}$

\therefore radius: $r = \frac{1}{2}\sqrt{p^2 + q^2}$ ✓

$$A = \frac{1}{2}\pi r^2$$

$$= \frac{1}{2}\pi \left(\frac{1}{2}\sqrt{p^2 + q^2}\right)^2$$

$$= \frac{1}{2}\pi \cdot \frac{1}{4}(p^2 + q^2) \dots\dots(1) \checkmark$$

Subs. (2) into (1):

$$= \frac{1}{8}\pi((10 - q)^2 + q^2) \checkmark$$

$$p + q = 10$$

$$p = 10 - q \dots(2) \checkmark$$

$$= \frac{1}{8}\pi(100 - 20q + q^2 + q^2)$$

$$= \frac{25}{2}\pi - \frac{5}{4}\pi q + \frac{1}{4}\pi q^2 \checkmark$$

For maximum Area: $A'(q) = 0$

$$\therefore -\frac{5}{4}\pi + \frac{1}{2}\pi q = 0 \checkmark$$

$$\frac{1}{2}\pi q = \frac{5}{4}\pi$$

$$\therefore q = \frac{5}{2} = 2,5 \text{ units } \checkmark$$

$$\therefore p = 10 - \frac{5}{2} = \frac{15}{2} = 7,5 \text{ units } \checkmark \quad [9]$$

QUESTION TWO:

2.1 Loan amount: $85\% \times 800000 = R680000 \checkmark$

$$680000 = \frac{x(1 - (1 + \frac{9,5\%}{12})^{-240})}{\frac{9,5\%}{12}} \quad \checkmark \checkmark \checkmark$$

$$x = R6338,49 \quad \checkmark \quad (5)$$

2.2 $R120000 + 6338,49 \times 240 = R1641237,60 \quad \checkmark \checkmark \quad (2)$

2.3 *Balance on the loan up to the end of the 7th year:*

$$B = \frac{6338,49(1 - (1 + \frac{9,5\%}{12})^{-156})}{\frac{9,5\%}{12}} \quad \checkmark \checkmark$$

$$= R566659,00 \quad \checkmark \quad (4)$$

2.4 After 7 years:

$$\text{Actual amount paid off on capital: } R680000,00 - 566659,00$$

$$= R113341,00 \quad \checkmark \checkmark$$

$$\text{Actual amount paid in 7 years: } 6338,49 \times 84 = R532433,16 \quad \checkmark$$

$$\text{Amount of interest paid: } R532433,16 - R113341,00 \quad \checkmark$$

$$= R419092,16 \quad \checkmark \quad (5)$$

[16]

Total: 25