

MATH3 (814013) – SPRING 2007

WORKSHEET 7

Question (1) : Evaluate the following:

- 1) $\frac{2005(2006^2 - 4)2007}{2008(2006^2 - 1)}$
- 2) $2006^2 - 2005 \times 2007$
- 3) $20008 \times 20004 - 20009 \times 20003$

Question (2) : Given that $x^2 + y^2 = 6$ and $xy = 3$, Compute $x^4 + y^4$.

Question (3) : Given that $x^2 + \frac{1}{x^2} = 3$, find $x^4 + \frac{1}{x^4}$.

Question (4) : Given that $a + b = -4$ and $ab = 3$, Compute $a^2 + b^2$.

Question (5) : Given that $(a - b)(a + b) = 5$ and $a^2 + b^2 = 13$, find the value of a and b .

Question (6) :

- (1) $4x^2 - 9y^2 =$

(A) $(2x - 3y)(2x - 3y)$ (B) $(2x - 3y)(2x + 3y)$ (C) $(2x - 3y)(3y - 2x)$ (D) None
- (2) $3x^2y + 6xy^2 =$

(A) $3xy(x + y)$ (B) $3xy(2x + y)$ (C) $3xy(x + 2y)$ (D) None
- (3) Which of the following is a prime number?

(A) 6 (B) 7 (C) 8 (D) None
- (4) Which of the following is a composite number?

(A) 5 (B) 6 (C) 7 (D) None
- (5) Which of the following is a prime polynomial?

(A) $x^2 - 1$ (B) $x^2 + 1$ (C) $x^3 + 1$ (D) None
- (6) When we subtract $x^2 + 1$ from $x^2 - 1$, the degree of the result is:

(A) 2 (B) 1 (C) 0 (D) None
- (7) If $x^2 + 7x + c = (x + 6)(x + 1)$ then $c =$

(A) 6 (B) 7 (C) 5 (D) None
- (8) If $x^2 + x - 12 = (x + c)(x - 3)$ then $c =$

(A) 6 (B) 4 (C) 5 (D) None

Question (7) : True or False:

(1) 8 is a prime number. ()

(2) 8 is a composite number. ()

(3) $x^2 - 9 = (x - 3)^2$ ()

(4) $x^2 + 2x + 5$ is a prime polynomial. ()

(5) If $a = 1$, $b = 0$ then $(a - b)^2 = a^2 - b^2$ ()

Question (8) : Factor the following completely:

$$x^5 - 13x^3 + 36x$$

Solution:

$$x^5 - 13x^3 + 36x = x(x^4 - 13x^2 + 36)$$

$$\text{Let } y = x^2$$

$$x^4 - 13x^2 + 36 = y^2 - 13y + 36$$

$$= (y - 9)(y - 4)$$

$$\text{So } x^5 - 13x^3 + 36x = x(x^2 - 9)(x^2 - 4)$$

$$= x(x - 3)(x + 3)(x - 2)(x - 2)$$

Where is the mistake in the above solution?