

**Final Revision October Exam (Algebra + Trigonometry)**

**1. Choose the correct answer:**

1)  $\sqrt{-2} \times \sqrt{-8} =$  \_\_\_\_\_

a) 4

b) -4

c) 4i

d) -16

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2) The simplest form of the imaginary number  $i^{42}$  is \_\_\_\_

a)  $-1$

b)  $1$

c)  $i$

d)  $-i$

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3) The solution set of the equation:  $x^2 + 9 = 0$  in  $C$  is \_

a)  $\{3, -3\}$

b)  $\{-3i\}$

c)  $\{3i, -3i\}$

d)  $\emptyset$

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4) If the curve of the quadratic function  $f$  intersects the  $x$ -axis at the two points  $(3, 0)$ ,  $(-1, 0)$ , then the solution set of the equation:  $f(x) = 0$  in  $R$  is \_\_\_\_\_

- a)  $\{3, 0\}$                       b)  $\{-1, 0\}$   
 c)  $\{-3, 1\}$                       d)  $\{3, -1\}$

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5) The opposite figure represents the curve

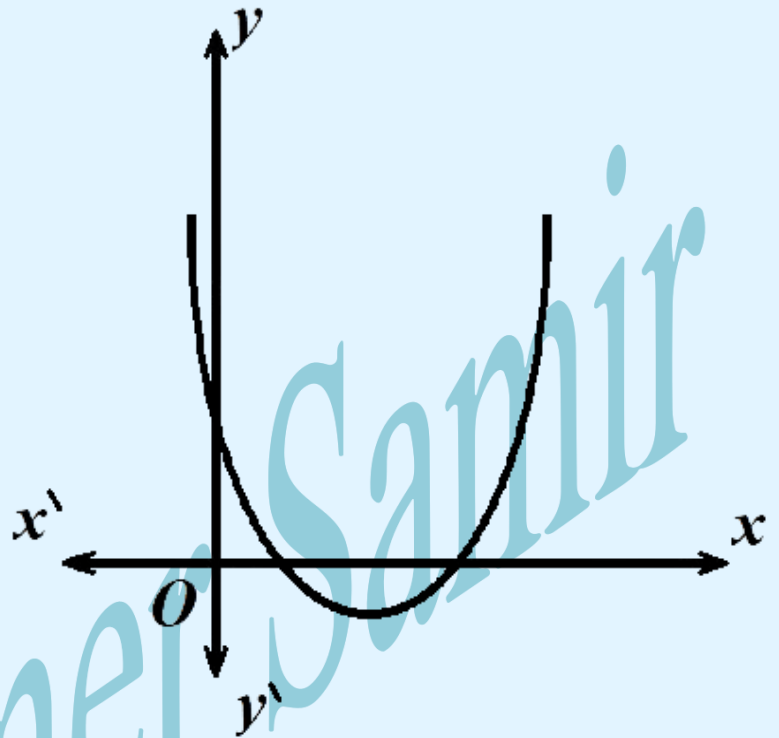
$y = ax^2 + bx + c$  , which of the following is true?

a)  $a < 0$  ,  $c < 0$

b)  $a > 0$  ,  $c < 0$

c)  $a < 0$  ,  $c > 0$

d)  $a > 0$  ,  $c > 0$



6) If the two roots of the equation:  $4x^2 - 12x + c = 0$  are equal, then  $c = \underline{\hspace{2cm}}$

a) 3

b) 4

c) 9

d) 16

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7) If  $x = -1$  is one of the roots of the equation:

$$x^2 - ax - 2 = 0, \text{ then } a = \underline{\hspace{1cm}}$$

a) 1

b) -1

c) 3

d) -3

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8) If  $a = 1 + \sqrt{2}i$  ,  $b = 1 - \sqrt{2}i$  , then  $ab =$  \_\_\_\_\_

a) -1

b) 1

c) 2

d) 3

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9) If the two roots of the equation:  $x^2 - 6x + k = 0$  are different and real, then  $k \in$  \_\_\_\_\_

a)  $]-\infty, 9[$       b)  $]9, \infty[$

c)  $]-\infty, 9]$       d)  $[9, \infty[$

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**10) If the roots of the equation:  $ax^2 + bx + c = 0$  are conjugate complex, which of the following is true?**

**a)  $b^2 - 4ac < 0$**

**b)  $b^2 - 4ac = 0$**

**c)  $b^2 - 4ac > 0$**

**d)  $b^2 - 4ac \leq 0$**

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11)  $(2 + 2i)^{20} = \underline{\hspace{2cm}}$

a)  $2^{20}$

b)  $2^{30}$

c)  $2^{20}i$

d)  $-2^{30}$

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**12) The angle of measure  $50^\circ$  in the standard position is equivalent to the angle of measure \_\_\_\_\_**

- a)  $130^\circ$       b)  $310^\circ$       c)  $140^\circ$       d)  $410^\circ$**

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**13) All the following are measures of angles that lie in the second quadrant except \_\_\_\_\_**

- a)  $-210^\circ$       b)  $120^\circ$       c)  $-120^\circ$       d)  $850^\circ$**

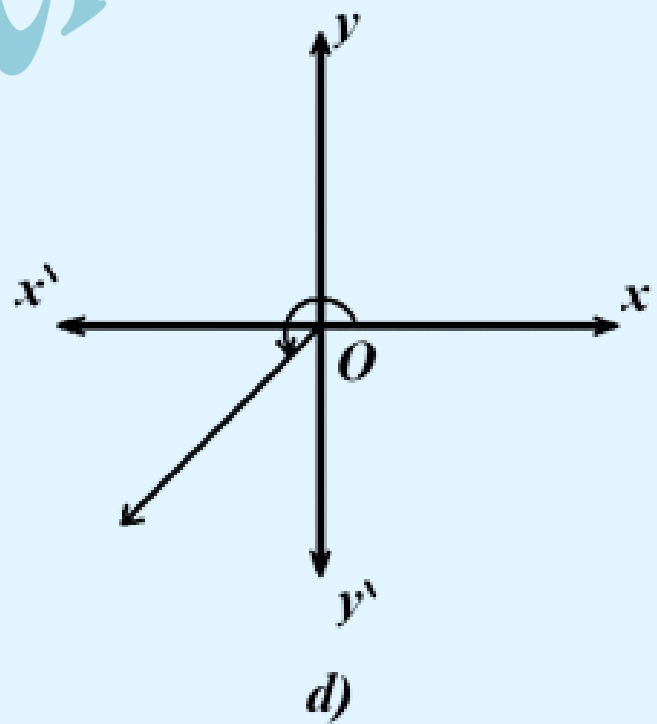
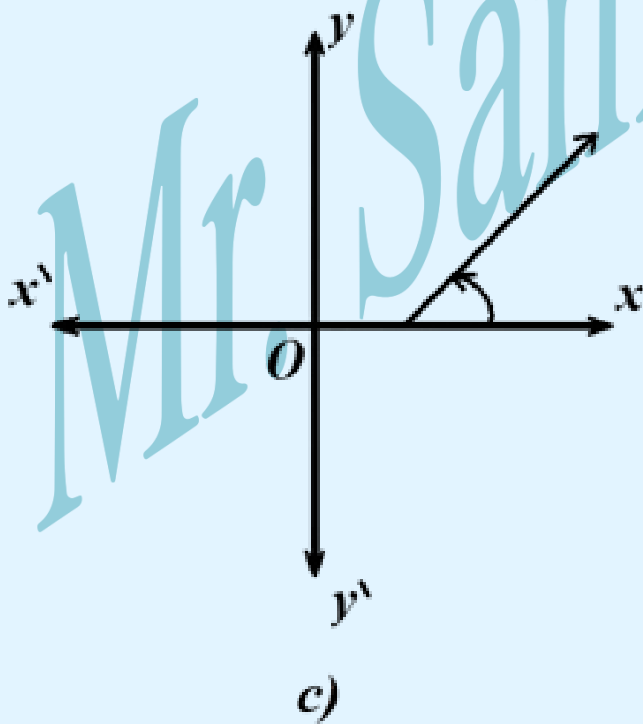
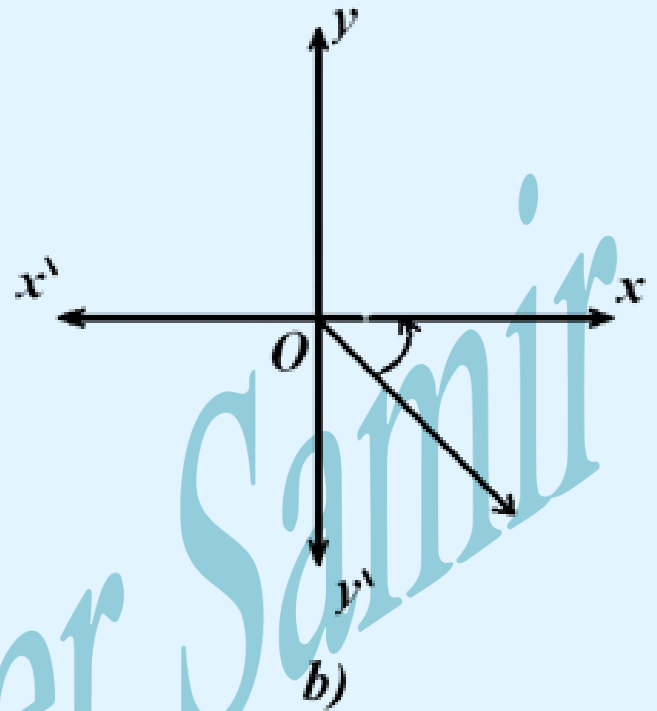
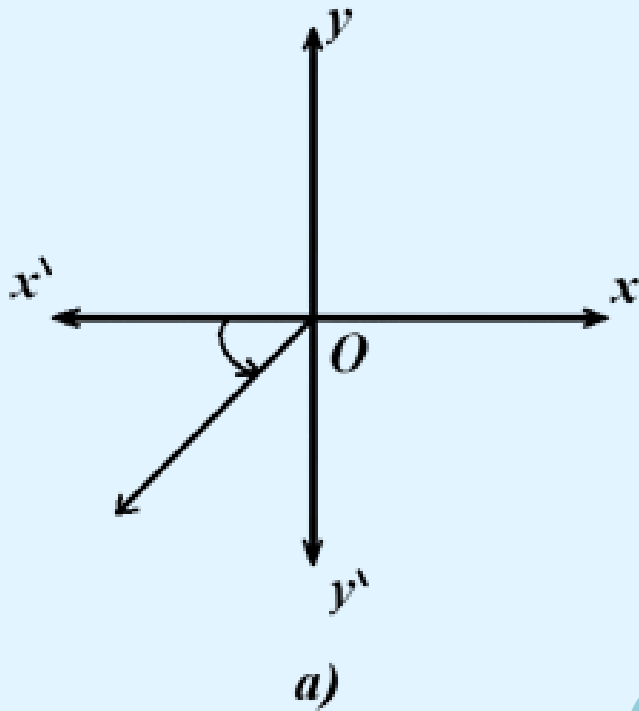
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14) The angle whose measure is  $(-750^\circ)$  lie in the \_\_\_\_\_ quadrant.

- a) first      b) second      c) third      d) fourth

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15) All the following directed angles aren't in the standard position except \_



**16) If the terminal side of an angle in the standard position passes through the point  $(-1, 0)$ , then the terminal side lies in the \_\_\_\_\_**

**a) first quadrant**

**b) second quadrant**

**c) third quadrant**

**d) fourth quadrant**

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**17) If  $A$  ,  $B$  are the measures of two equivalent angles, then:  $-A$  ,  $-B$  are \_\_**

**a) supplementary**

**b) equivalent**

**c) complementary**

**d) their sum is  $-360^\circ$**

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18) The angle whose measure is  $\frac{9\pi}{4}$  lie in the \_\_\_\_\_ quadrant.

a) first

b) second

c) third

d) fourth

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**19) The degree measure of a central angle in a circle of radius length 6 cm and opposite to an arc of length  $3\pi$  cm equals \_\_\_\_\_**

**a)  $30^\circ$**

**b)  $60^\circ$**

**c)  $90^\circ$**

**d)  $120^\circ$**

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20) The angle whose measure is  $-7.3^{\text{rad}}$  is equivalent to the angle whose degree measure is \_\_\_\_\_

a)  $58^{\circ} 15' 33''$

b)  $301^{\circ} 44' 27''$

c)  $-233^{\circ} 15' 33''$

d)  $211^{\circ} 44' 27''$

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**21) The radian measure of the central angle subtending an arc of length 3 cm in a circle whose diameter length is 4 cm equal \_\_\_\_\_**

a)  $\left(\frac{2}{3}\right)^{\text{rad}}$

b)  $\left(\frac{3}{2}\right)^{\text{rad}}$

c)  $5^{\text{rad}}$

d)  $6^{\text{rad}}$

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22) *The positive measure of the angle between the hour hand and the minute hand at half past two equals \_\_*

a)  $\frac{\pi}{4}$

b)  $\frac{5\pi}{12}$

c)  $\frac{7\pi}{12}$

d)  $\frac{3\pi}{4}$

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23) If  $A$  ,  $-A$  are measures of two equivalent angles,  
then one of the values of  $A$  is \_\_\_\_\_

- a)  $150^\circ$       b)  $90^\circ$       c)  $180^\circ$       d)  $270^\circ$

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24) The radian measure of the central angle which subtends an arc of length 5 cm in a circle of diameter length is 10 cm equals \_\_\_\_\_

a)  $\left(\frac{1}{2}\right)^{\text{rad}}$

b)  $1^{\text{rad}}$

c)  $2^{\text{rad}}$

d)  $\pi$

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- 25) *The measure of the smallest positive angle equivalent to the angle whose measure is  $(-870^\circ)$  is \_\_\_\_*
- a)  $210^\circ$       b)  $150^\circ$       c)  $-210^\circ$       d)  $120^\circ$

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26) If  $x^2 - 2x + 4 = 0$  , then  $x =$ \_\_\_\_\_

a)  $1 \pm 3i$

b)  $1 \pm \sqrt{3}$

c)  $1 \pm \sqrt{3}i$

d)  $1 \pm i$

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27) The simplest form of the imaginary number  $i^{39}$  is \_\_\_\_

a) 1

b) -1

c)  $i$

d)  $-i$

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28) If  $x + yi = (1 - 2i)(1 + i)$  where  $x, y \in R$ , then

$x + y =$  \_\_\_\_\_

a) 2

b) -2

c) 3

d) 4

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29) The angle of measure  $-60^\circ$  in standard position is equivalent to the angle of measure \_\_\_\_\_

- a)  $60^\circ$       b)  $120^\circ$       c)  $30^\circ$       d)  $-300^\circ$

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30) The angle of measure  $585^\circ$  in standard position is equivalent to the angle of measure \_\_\_\_\_

- a)  $45^\circ$       b)  $135^\circ$       c)  $225^\circ$       d)  $315^\circ$

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31) The angle of measure  $-870^\circ$  lies in the \_\_\_\_\_ quadrant.

- a) first      b) second      c) third      d) fourth

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32) If  $x + yi = (1 + i)^4$  where  $x, y \in R$ , then  $x - y =$  \_\_\_\_

a) 16

b) -16

c) 4

d) -4

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33)  $2 + i + i^2 + i^3 = \underline{\hspace{2cm}}$

a) 2

b) 1

c) -1

d) zero

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**2. Answer the following essay questions:**

**1) Find in  $C$  the solution set of the equation:**

$$x^2 - 2x + 4 = 0$$

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2) Find the value of  $x$  and  $y$  which satisfy that:

$$x + iy = \frac{(2 + i)(2 - i)}{3 + 2i}$$

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**3) Prove that the two roots of the equation:**

**$3x^2 - 4x + 5 = 0$  aren't real, then find the solution set of the equation in  $\mathbb{C}$**

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**4) Find the values of  $k$  which make the equation:**

**$kx^2 - 4x + 4 = 0$  have two complex and not real roots**

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**5) Determine the quadrant in which each of the following angles lie:**

**a)  $-52^\circ$**

**b)  $220^\circ$**

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**6) Find two angles, one of them with positive measure and the other with negative measure having common terminal side for each of the following angles:**

**a)  $-132^\circ$**

**b)  $-730^\circ$**

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**7) Find the length of the arc which is opposite to an inscribed angle of measure  $60^\circ$  in a circle whose radius length is 10 cm**

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8) *ABC is a triangle in which:  $m(\angle A) = 70^\circ$*

*$m(\angle B) = 60^\circ$ , find in radian measure  $m(\angle C)$*

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9) *Without using calculator, find the value of:*

$$3\sin 30^\circ \sin^2 60^\circ - \cos 0^\circ \sec 60^\circ + \sin 270^\circ \cos^2 45^\circ$$

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10) Solve the equation:  $x^2 - 4x + 5 = 0$  in the set of the complex numbers

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