



ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

First Term Examination - 2018



Class : 7

SUB : Algebra and Geometry

F.M.: 80

DURATION: 2 Hrs30Mins

DATE:25.04.2018

Group-A

1. Choose the correct answer.

1x5=5

i) Degree of this polynomial $3x^7 + 15 + x - 2x^{10}$ is

a) 7 b) 10 c) 1 d) none of these

ii) If $x+2=6$, then the value of x is

a) 4 b) 1 c) -4 d) 2

iii) Complementary angle of 77° is

a) 103° b) 13° c) 3° d) none of these

iv) A straight line cuts two other straight lines and the following are the pairs of alternate angles in different cases. Show in which of these cases the two straight lines are parallel.

a) $35^\circ, 36^\circ$ b) $80^\circ, 80^\circ$ c) $57^\circ, 69^\circ$ d) $119^\circ, 119^\circ$

v) Product of $4a$, $5b$ and $-6ab$ is

a) $-120a^2b^2$ b) $120a^2b^2$ c) $90a^2b^2$ d) none of these

2. Fill in the blanks.

1x5=5

i) After solving $\frac{2x}{3}=8$, we get, $x=$ _____.

ii) Arranging $8x^2 - 3x^4 - 12 + 6x^3$ in order of decreasing degree in x we get_____.

iii) Three or more points which lie on the same line are called_____.

iv) A line that divides an angle into two equal angles is called_____.

v) If two coplanar lines are cut by a transversal and they are parallel, then alternate interior angles are_____.

3. Write down True or False.

1x5=5

i) $\frac{x}{y} - 2x^3 + 4x^4y^2 - 7$ is a polynomial.

ii) If $8t=32$ then, $t=4$.

iii) If $3x+2=14$, then $x=3$.

iv) Corresponding angles lie on the opposite sides of the transversal.

v) In a polynomial exponents of the variables are always positive integers.

Group – B

4. Write very short answer of the following questions:

2x5=10

- (i) Add: $8a - 3b$ and $2a + 6b$.
- (ii) Find the product of $-8x^2y$ and $3x^3y^3$.
- (iii) Solve: $\frac{a}{3} - 7 = 4$
- (iv) Find the supplement of 84° .
- (v) Define reflex angle.

5. Write short answer of the following questions:

3x5=15

- (i) Divide: $-54x^4y^3z$ by $6x^2y^2z$.
- (ii) Solve: $8y - 3 - 5y = 24$

OR

Solve: $14 + 2n - 6 + 8n = 4n - 21 + n + 34$

(iii) The sum of two numbers is 11 and one of them is 3 greater than the other; find the numbers.

OR

Bubai is now 7 years older than Sayan. If the sum of their ages is 33 years, find the age of each.

- (iv) What do you mean by liner pair? Draw the diagram.
- (v) Mention three conditions to prove two lines are parallel.

Group – C

6. Write the answer of the following questions:

5x8=40

(i) Simplify: $5x + 3 - [2x - \{x - 3(5x - 6)\}]$

(ii) Divide: $2x^2 - 11x + 12$ by $x - 4$.

Or

Divide: $x^3 - 8$ by $x - 2$, $x \neq 2$.

(iii) Simplify: $(x^2 - 4xy - 4y^2)(2x^2 + 8xy + 2y^2)$.

(iv) Solve: $\frac{x}{2} + \frac{x}{3} = 10$

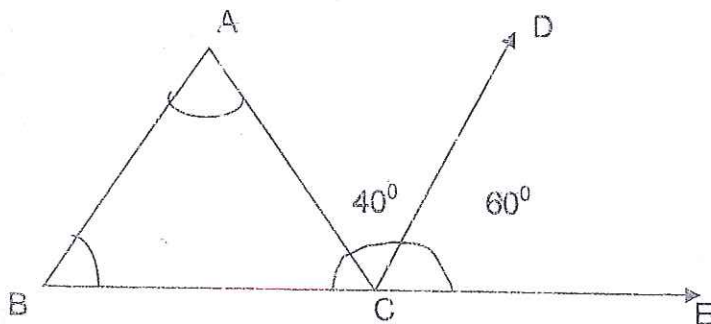
(v) One-third of a number is 2 more than one-fourth of the number. Find the number.

Or

If 14 is added to a number, the sum is 35. Find the number.

(vi) Two complementary angles are in the ratio of 4:5. Find the angles.

(vii) In the given figure, $\angle DCE = 60^\circ$ and $\angle ACD = 40^\circ$, Find $\angle A$, $\angle B$ and $\angle C$, when $AB \parallel CD$.



(viii) Construct an angle of 90° . Draw its angular bisector.



ST. LAWRENCE HIGH SCHOOL

A Jesuit Christian Minority Institution



First Term Examination

Sub: Algebra & Geometry Answerkey Class: VII

F.M.: 80

Duration: $2\frac{1}{2}$ Hours

Date: 25/4/2018

Group - A

1. Choose the correct answer.

i) Degree of this polynomial $3x^7 + 15 + x - 2x^{10}$ is

b) 10

ii) If $x+2=6$. then the value of x is

a) 4

iii) Complementary angle of 77° is

b) 13°

iv) A straight line cuts two other straight lines and the following are the pairs of alternate angles in different cases. Show in which of these cases the two straight lines are parallel.

b) $80^\circ, 80^\circ$ d) $119^\circ, 119^\circ$

v) Product of $4a$, $5b$ and $-6ab$ is

a) $-120a^2b^2$

2. Fill in the blanks.

i) After solving $\frac{2x}{3}=8$, we get, $x=12$

ii) Arranging $8x^2 - 3x^4 - 12 + 6x^3$ in order of decreasing degree in x we get $-3x^4 + 6x^3 + 8x^2 - 12$

iii) Three or more points which lie on the same line are called collinear points

iv) A line that divides an angle into two equal angles is called Bisector.

v) If two coplanar lines are cut by a transversal and they are parallel, then alternate interior angles are Equal

3. Write down True or False.

i) $\frac{x}{y} - 2x^3 + 4x^4y^{-2} - 7$ is a polynomial. False

ii) If $8t=32$ then, $t=4$. True

iii) If $3x+2=14$, then $x=3$. False

iv) Corresponding angles lie on the opposite sides of the transversal. False

v) In a polynomial exponents of the variables are always positive integers. True

Group - B

4.

(i) $(8a - 3b) + (2a + 6b)$
 $= 10a + 3b.$

(ii) $-8x^2y \times 3x^3y^3$
 $= -24x^5y^4$

(iii) $\frac{a}{3} - 7 = 4$

$\Rightarrow \frac{a}{3} = 4 + 7$

$\Rightarrow \frac{a}{3} = 11$

$\Rightarrow a = 11 \times 3 = 33$

(iv) Supplement of $84^\circ = 180^\circ - 84^\circ = 96^\circ$

(v) Reflex angle: An angle whose magnitude lies between 180° and 360° is called a reflex angle.

5.

(i) $\frac{-54x^4y^3z}{6x^2y^2z} = -9x^2y.$

(ii) $8y - 3 - 5y = 24$

$\Rightarrow 3y = 24 + 3$

$\Rightarrow 3y = 27$

$\Rightarrow y = \frac{27}{3} = 9.$

Or

$14 + 2n - 6 + 8n = 4n - 21 + n + 34$

$\Rightarrow 2n + 8n - 4n - n = 34 - 21 - 14 + 6$

$\Rightarrow 10n - 5n = 40 - 35$

$\Rightarrow 5n = 5$

$\Rightarrow n = \frac{5}{5} = 1.$

(iii) Let the smaller number be x

\therefore the greater number be $x + 3$

BTP

$x + (x + 3) = 11$

$\Rightarrow x + x + 3 = 11$

$\Rightarrow 2x + 3 = 11$

$\Rightarrow 2x = 11 - 3$

$\Rightarrow 2x = 8$

$\Rightarrow x = \frac{8}{2} = 4$

So, the numbers are 4 and $4 + 3 = 7.$

Or

Let Sayan's age be x years; then Bubai's age be $(x + 7)$ years.

BTP

$x + (x + 7) = 33$

$\Rightarrow x + x + 7 = 33$

$\Rightarrow 2x + 7 = 33$

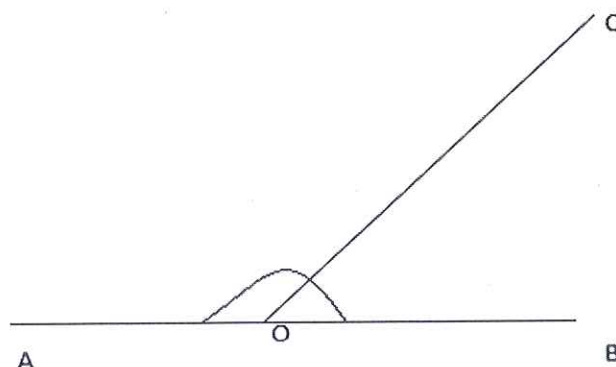
$\Rightarrow 2x = 33 - 7$

$\Rightarrow 2x = 26$

$\Rightarrow x = \frac{26}{2} = 13$

\therefore Sayan's age is 13 years and Bubai's age is $(13 + 7) = 20$ years.

(iv) Adjacent angles whose two non-common arms are opposite rays, form a linear pair.



(v) Conditions for proving two lines are parallel:

- The alternate angles are equal.
- The corresponding angles are equal.
- The sum of two co-interior angles is 180°

Group – C

$$\begin{aligned} \text{(i)} \quad & 5x + 3 - [2x - \{x - 3(5x - 6)\}] \\ &= 5x + 3 - [2x - \{x - 15x + 18\}] \\ &= 5x + 3 - [2x - x + 15x - 18] \\ &= 5x + 3 - [16x - 18] \\ &= 5x + 3 - 16x + 18 \\ &= -11x + 21 \end{aligned}$$

$$\begin{array}{r} \text{(ii)} \quad \\ \overline{2x^2 - 11x + 12} \\ x-4 \left| \begin{array}{r} 2x^2 - 11x + 12 \\ 2x^2 - 8x \\ \hline (-) \\ -3x + 12 \\ -3x + 12 \\ \hline \end{array} \right. \end{array}$$

Or

Divide: $x^3 - 8$ by $x - 2$, $x \neq 2$.

$$\begin{array}{r} \\ \overline{x^3 - 8} \\ x-2 \left| \begin{array}{r} x^3 - 8 \\ \hline (-) \\ 2x^2 - 8 \\ 2x^2 - 4x \\ \hline (-) \\ 4x - 8 \\ 4x - 8 \\ \hline \end{array} \right. \end{array}$$

$$\begin{aligned} \text{(iii)} \quad & (x^2 - 4xy - 4y^2)(2x^2 + 8xy + 2y^2) \\ &= x^2(2x^2 + 8xy + 2y^2) - 4xy(2x^2 + 8xy + 2y^2) - 4y^2(2x^2 + 8xy + 2y^2) \\ &= 2x^4 + 8x^3y + 2x^2y^2 - 8x^3y - 32x^2y^2 - 8xy^3 - 8x^2y^2 - 32xy^3 - 8y^4 \\ &= 2x^4 - 38x^2y^2 - 40xy^3 - 8y^4 \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad & \frac{x}{2} + \frac{x}{3} = 10 \\ \Rightarrow & \frac{3x+2x}{6} = 10 \\ \Rightarrow & 3x + 2x = 60 \\ \Rightarrow & 5x = 60 \\ \Rightarrow & x = \frac{60}{5} \\ \Rightarrow & x = 12 \end{aligned}$$

(v) Let the number be x, then BTP

$$\frac{x}{3} = \frac{x}{4} + 2$$

$$\Rightarrow \frac{x}{3} - \frac{x}{4} = 2$$

$$\Rightarrow \frac{4x-3x}{12} = 2$$

$$\Rightarrow x = 24$$

The number is 24.

Or

Let the number be x, the BTP

$$x + 14 = 35$$

$$\Rightarrow x = 35 - 14$$

$$\Rightarrow x = 21.$$

The number is 21.

(vi) Let two complementary angles be $4x$ and $5x$.

$$\text{BTP, } 4x + 5x = 90^\circ$$

$$\Rightarrow 9x = 90^\circ$$

$$\Rightarrow x = \frac{90^\circ}{9} = 10^\circ$$

\therefore the angles are: $4 \times 10^\circ = 40^\circ$ and $5 \times 10^\circ = 50^\circ$.

(vii) $\angle A = \angle ACD = 40^\circ$, being alternate angles are equal.

$\angle B = \angle DCE = 60^\circ$, being corresponding angles are equal.

$\angle C = 80^\circ$, since sum of three angles of a triangle is 180° .

(viii) Construct an angle of $\angle 90^\circ$ with a protractor and draw the bisector with the help of compass.

