

## ST. LAWRENCE HIGH SCHOOL MODEL ANSWER



3rd Term Exam - 2018

Sub:	Algebra and Geometry	7
Dura	tion: 2hrs 30 mins	

Sub: Algebra Duration: 2h	and Geometry rs 30 mins	Class: VIII	r.M.: 80		
	<u>Group</u> – A	<b>A</b>			
	option for the following q ctangle and an isosceles trap		ne questions) 1x5=5		
<ul> <li>a) Two equal diagonals.</li> <li>c) interior angles sum up to 360<sup>0</sup></li> <li>Ans: c) interior angles sum up to 3</li> </ul>		<ul><li>b) opposite sides e</li><li>d) opposite angles</li></ul>			
ii) Solving : $-(2x$ a) 7 Ans: c) $-1$	+ 8) = -6, we get; $x = $ b) $-2$	c) -1	d) 4		
Iii) Factorizing 1 –	$(1-x)^2$ , we get-				
a) $2(x)$ Ans: d) $x(2-x)$	b) $(1+x)(2-x)$	c) $(-x)(2-x)$	d) $x(2-x)$		
	adrilateral are in the ratio 1:	: 2: 3: 4, what will be the	e measure of the largest angle of		
it? a) 72 <sup>0</sup> Ans: c) 144 <sup>0</sup>	b) 82 <sup>0</sup>	c) 144 <sup>0</sup>	d) 360 <sup>0</sup>		
v) The term, that shoul a) +12	d be added with $144x^2 + \frac{1}{4x}$ b) $-12$ c) both 'a	$\frac{1}{e^2}$ to make it a perfect so and 'b' are correct	quare number, is – d) none of these		
Ans: c) both 'a' ar	nd 'b' are correct				
i) A figure made Ans: Concurre	ent. $(a+4b)^2 - $	) ree of which are	1x5=5		
	n(2y-x)=(x-2y)(	)			
iv) The diagonals	of a rhombus bisect each oth	ner but they are not			
	otational symmetry of a regu	lar hexagon is			
Ans: Six 3. Write 'True' or '	False'. (Don't write 'T' or	'F'). (Answer all the q	uestions) 1x5=		
and the second s	$(-7)^2$ . Ans: False				
	ii) Solving $0.11 x = 33$ , we get $x = 3.3$ . Ans: False iii) $3x^2 + 4x + 1 + x^2$ is not a perfect square number. Ans: False				
	$+ x^2$ is not a perfect square annot have two parallel sides				
iv) A trapezium ca v) The coordinate	e of the point $(2, -3)$ when i	reflected in X-axis, beco	omes $(3,-2)$ . Ans: False		

Group-B

4. Answer the following:

 $2 \times 5 = 10$ 

a. Find the coefficient of X in (x+1) (3-x). Ans:  $(x+1)(3-x)=2x-x^2+3$  so, coefficient of x is 2.

b. Find the value of 102 x 98 (without actual multiplication)

Ans: (100+2)(100-2)=1000-4=9996

c. Factorize (x+3)x + (x+3)y

Ans: (x+3)(x+y)

d. Find the sum of interior angles of a 7 sided polygon.

Ans:  $(2n-4) \times 90^0 = (2 \times 7-4) \times 90^0 = 900^0$ 

e. Write the coordinate of point P(4,6) when reflected in X axis.

Ans:(4-6)

## 5. Answer any five questions:

 $3 \times 5 = 15$ 

a. Find the value of  $a^2 + b^2$  when a - b = 7 and ab = 18.

Ans:  $a^2+b^2=(a-b)^2+2ab=(7)^2+2.18=49+36=85$ 

b. Factorize  $4x^4 - 12x^2 + 9$ 

Ans: 
$$(2x^2)^2 - 2.2x.3 + (3)^2 = (2x^2 - 3)^2 = (2x^2 - 3)(2x^2 - 3)$$

c. Solve: 3(x+1) + 4x = 24.

Ans: 3(x+1) + 4x = 24.

or, 7x = 21 or, x=3

d. Find the four angles of a quadrilateral if they are in the ratio 3:5:7:9.

Ans: Let the angles be 3x,5x,7x and 9x. Therefore,  $3x+5x+7x+9x = 360^{\circ}$ 

or,  $24x = 360^{\circ}$  or,  $x = 15^{\circ}$ .

Hence the angles are: 45°,75°,105°,135°.

e. Write the properties of a rhombus.

Ans: i.All sides are equal.

ii. Opposite angles are equal.

iii. The diagonals bisect the interior angles.

iv. The diagonals bisect each other at right angles.

f. Find the number of sides of a polygon, the sum of whose interior angle is 1440°.

Ans: Sum of the interior angles:  $(2n - 4) \times 90^{\circ} = 1440^{\circ}$  or,  $2n = 1440^{\circ}/90^{\circ} + 4 = 20$ 

or, n = 10.

Hence number of sides is 10.

g. What is the rotational symmetry and order of rotational symmetry?

Ans: A figure is said to have a rotational symmetry if it fits onto itself more than one in one complete rotation. The number of times a figure fits into itself in one complete rotation is called order of rotational symmetry.

## **GROUP C**

Q6. Answer the following questions(any nine)

5X9

i. Factorise:  $x^2 + 16x - 225$ 

Ans: 
$$x^2 + 25x - 9x - 225 = (x + 25)(x - 9)$$
.

ii. Factorise:  $6x^3 - 7x^2 - 5x$ 

Ans: 
$$x(6x^2 - 7x - 5) = x(6x^2 - 10x + 3x - 5) = x(2x + 1)(3x - 5)$$

iii. Naresh can finish a work in 18 hours while Anuj can complete the same work in 24 hours. How long will it take them together to complete the work if Naresh is called away for 2 hours while Anuj continues with the work?

Ans: Let Anuj does the work for x hours and naresh does the work for (x-2) hours.

Therefore in 1 hour by both together work done = 
$$\frac{x-2}{18} + \frac{x}{24}$$

So, whole work = 
$$\frac{x-2}{18} + \frac{x}{24} = 1$$

Or, 
$$x = \frac{80}{7} = 11\frac{3}{7} hours$$

iv. solve 
$$\frac{(x-4)(3x+2)-3x^2+4}{x-3} = 2$$

Ans: 
$$3x^2 - 10x - 8 - 3x^2 + 4 = 2x - 6$$
,

$$or, 12x = 2, or, x = \frac{1}{6}$$
.

v. Four years ago, the ratio of the ages of A and B was 2:3 and after 4 years it becomes 5:7. Find their present ages.

Ans: Let the present ages of A and B are x years and y years respectively. So according to the question 3(x-4) = 2(y-4) ......(i)

and 
$$7(x+4) = 5(y+4)$$
....(ii)

solving x = 36 years and y = 52 years.

vi. Prove that the diagonal BD of kite ABCD bisect the interior angles <B and <D.

Ans: In triangles ABD and CBD, AB=BC, AD = CD, BD=BD

Therefore those are congruent. So, diagonal BD bisect <ABC and <ADC

vii. Prove that the sum of the interior angles of an octagon is twice the sum of the interior angles of a pentagon.

Ans: For the octagon, total internal angle =  $(2 \times 8 - 4) \times 90^0 = 12 \times 90^0$ 

For the pentagon, total internal angle =  $(2 \times 5 - 4) \times 90^0 = 6 \times 90^0$ 

Hence it is clear from the above two equation that –

Interior angles of an octagon is twice the sum of the interior angles of a pentagon.

viii. Constuct the quadrilateralABCD in which AB =4cm, BC=6cm, CD= 5.5 cm, AD= 5cm and AC= 8cm.

Ans: first draw the lines using scale and then using compass form the quadrilateral.

ix. Plot the points (2,1), (-1,3), (-3, 0), (0, -2) on a graph and join them. What is the name of the figure?

Ans: Using a graph paper, after plotting the points and then joining them, you will get a quadrilateral.

x. The digits of a two-digit number are in the ratio 2:3 and the number obtained by interchanging greater than the original number by by 27. What is the original number?

St. J. Charles to J.

Let the two digited number be 10x + y.

According to the question 3x = 2y .....(i) and

$$10y + x = 10x + y + 27....(ii)$$

Solving x = 6 and y = 9. So the number is 69.