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All you have to do is tap on the quick links available for 9th Class Maths Polynomials NCERT Textbooks PDF here and you will be directed to a new page having the download option. Click on the download option and save them for future reference and prepare as and when you need them. Question 1. Find the zeros of each of the following quadratic polynomials and verify the relationship between the zeros and their co-efficients : Solution: (i) f(x) = x2 – 2x – 8 Question 2. For each of the following, find a quadratic polynomial whose sum and product respectively of the zeroes are as given. Also, find the zeroes of these polynomials by factorization. Solution: (i) Given that, sum of zeroes (S) = – \\(\frac { 8 }{ 3 }\\) and product of zeroes (P) = \\(\frac { 4 }{ 3 }\\) Required quadratic expression, Question 3. If α and β are the zeros of the quadratic polynomial f(x) = x2 – 5x + 4, find the value of \\(\frac { 1 }{ \alpha } +\frac { 1 }{ \beta } -2\alpha \beta\\). Solution: Question 4. If α and β are the zeros of the quadratic polynomial p(y) = 5y2 – 7y + 1, find the value of \\(\frac { 1 }{ \alpha } +\frac { 1 }{ \beta }\\) Solution: Question 5. If α and β are the zeros of the quadratic polynomial f(x) = x2 – x – 4, find the value of \\(\frac { 1 }{ \alpha } +\frac { 1 }{ \beta } -\alpha \beta\\) Solution: Question 6. If α and β are the zeros of the quadratic polynomial f(x) = x2 + x – 2, find the value of \\(\frac { 1 }{ \alpha } -\frac { 1 }{ \beta }\\) Solution: Question 7. If one zero of the quadratic polynomial f(x) = 4x2 – 8kx – 9 is negative of the other, find the value of k. Solution: Question 8. If the sum of the zeros of the quadratic polynomial f(t) = kt2 + 2t + 3k is equal to their product, find the value of k. Solution: Question 9. If α and β are the zeros of the quadratic polynomial p(x) = 4x2 – 5x – 1, find the value of α2β + αβ2. Solution: Question 10. If α and β are the zeros of the quadratic polynomial f(t) = t2 – 4t + 3, find the value of α4β3 + α3β4. Solution: Question 11. If α and β are the zeros of the quadratic polynomial f(x) = 6x4 + x – 2, find the value of \\(\frac { \beta }{ \alpha }\\) Solution: Question 12. If α and β are the zeros of a quadratic polynomial p(s) = 3s2 – 6s + 4, find the value of \\(\frac { \alpha }{ \beta } +\frac { \beta }{ \alpha } +2\left(\frac { 1 }{ \alpha } +\frac { 1 }{ \beta } \right) +3\alpha \beta\\) Solution: Question 13. If the squared difference of the zeros of the quadratic polynomial f(x) = x2 + px + 45 is equal to 144, find the value of p Solution: Question 14. If α and β are the zeros of the quadratic polynomial f(x) = x2 – p(x + 1) – c, show that: Solution: Question 15. If α and β are the zeros of the quadratic polynomial f(x) = x2 – p(x + 1) – c, form a polynomial whose zeros are (α + β)2 and (α – β)2. Solution: Question 16. If α and β are the zeros of the quadratic polynomial such that α + β = 24 and α – β = 8, find a quadratic polynomial having α and β as its zeros. Question 17. If α and β are the zeros of the quadratic polynomial f(x) = x2 – 1, find a quadratic polynomial whose zeros are \\(\frac { 2\alpha }{ \beta }\\) and \\(\frac { 2\beta }{ \alpha }\\) Solution: Question 18. If α and β are the zeros of the quadratic polynomial f(x) = x2 – 3x – 2, find a quadratic polynomial whose zeros are \\(\frac { 1 }{ 2\alpha +\beta }\\) and \\(\frac { 1 }{ 2\beta +\alpha }\\) Solution: Question 19. If α and β are the zeros of the quadratic polynomial whose roots are : (i) α + 2, β + 2 (ii) \\(\frac { \alpha -1 }{ \alpha +1 },\frac { \beta -1 }{ \beta +1 }\\) Solution: Question 20. If α and β are the zeros of the quadratic polynomial f(x) = x2 + px + q, then evaluate : RD Sharma Class 10 Solutions Chapter 2 Polynomials Ex 2.1 RD Sharma Class 10 Solutions Chapter 2 Polynomials Ex 2.2 RD Sharma Class 10 Solutions Do you need help with your Homework? Are you preparing for Exams?Study without Internet (Offline) Share this with your friendsSUBSCRIBE In this chapter, we provide NCERT Exemplar Problems Solutions for Class 9 Maths Solutions Chapter 2 Polynomials for English medium students, Which will very helpful for every student in their exams. Students can download the latest NCERT Exemplar Problems Solutions for Class 9 Maths Solutions Chapter 2 Polynomials pdf, free NCERT Exemplar Problems Solutions for Class 9 Maths Solutions Chapter 2 Polynomials book pdf download. Now you will get step by step solution to each question.TextbookNCERTClassClass 9SubjectMathsChapterChapter 2Chapter NamePolynomialsCategoryNCERT ExemplarNCERT Exemplar Class 9 Maths Solutions Chapter 2 PolynomialsExercise 2.1: Multiple Choice Questions (MCQs)Question 1:Which one of the following is a polynomial?Solution:Question 2:√2 is a polynomial of degree(a) 2   (b) 0   (c) 1   (d)½Solution:(b) √2 = -√2x0. Hence, √2 is a polynomial of degree 0, because exponent of x is 0.Question 3:Degree of the polynomial 4x4 + 0x3 + 0x5 + 5x+ 7 is(a) 4   (b) 5   (c) 3   (d) 7Solution:(a) Degree of 4x4 + 0x3 + 0x5 + 5x + 7 is equal to the highest power of variable x. Here, the highest power of x is 4.Hence, the degree of a polynomial is 4.Question 4:Degree of the zero polynomial is(a) 0   (b) 1(c) any natural number   (d) not definedSolution:(d) The degree of zero polynomial is not defined, because in zero polynomial, the coefficient of any variable is zero i.e., Ox2 or Ox5.etc.Hence, we cannot exactly determine the degree of variable.Question 5:If p (x) = x2 – 2√2x + 1, then p (2√2) is equal to(a) 0   (b) 1   (c) 4√2   (d) 8 √2 +1Solution:(b) Given, p(x) = x2 – 2√2x + 1 ...(i)On putting x = 2√2 in Eq. (i), we getP(2√2) = (2√2)2– (2√2)(2√2) + 1 =8-8+1=1Question 6:The value of the polynomial 5x – 4x2 + 3, when x = – 1 is(a)-6   (b) 6   (c) 2   (d) -2Solution:(a) Let p (x) = 5x – 4x2 + 3 ...(i)On putting x = -1 in Eq. (i), we getp(-1) = 5(-1) -4(-1)2 + 3= -5-4+3 = -6Question 7:If p (x) = x + 3, then p(x)+ p (- x) is equal to(a) 3   (b) 2x   (c) 0   (d) 6Solution:(d) Given p(x) = x+3, put x = -x in the given equation, we get p(-x) = -x+3Now, p(x)+ p(-x) = x+ 3+ (-x)+ 3=6Question 8:Zero of the zero polynomial is(a) 0   (b) 1   (c) any real number   (d) not definedSolution:(c) Zero of the zero polynomial is any real number.e.g., Let us consider zero polynomial be 0(x-k), where k is a real number For determining the zero, putx-k = 0=>x = k Hence, zero of the zero polynomial be any real number.Question 9:Zero of the polynomial p(x)=2x+5 is(a)-2/5   (b) -5/2   (c)2/5   (d)5/2Solution:(b) Given, p(x)=2x+5For zero of the polynomial, put p(x) = 0   ∴   2x + 5 => 0-5/2Hence, zero of the polynomial is -5/2.Question 10:One of the zeroes of the polynomial 2x2 + 7x – 4 is(a)2   (b)½   (c)-1   (d)-2Thinking Process(i) Firstly, determine the factor by using splitting method.(ii) Further, put the factors equals to zero, then determine the values of x.Solution:(b) Let p (x) = 2x2 + 7x-4x Since, (x + 1) is a factor of p(x), thenp(-1)=02(-1)2 + k(-1) = 0=> 2-k = 0 => k= 2Hence, the value of k is 2.Question 13:x +1 is a factor of the polynomial(a) x3 + x2 + x + 1   (b) x3 + x2 + x+1(c) x4 + 3x3 + 3x2 + x +1Solution:Let assume (x + 1) is a factor of x3 + x2 + x+1.So, x = -1 is zero of x3 + x2 + x+1(-1)3 + (-1)2 + (-1) + 1 = 0 => -1+1-1 + 1 = 0 => 0 = 0 Hence, our assumption is true.Question 14:One of the factors of (25x2 – 1) + (1 + 5x)2 is(a) 5 + x   (b) 5 – x   (c) 5x -1   (d)10xSolution:(d) Now, (25x2 -1) + (1 + 5x)2= 25x2 -1 + 1 + 25x2 + 10x [using identity, (a + b)2 = a2 + b2 + 2ab]= 50x2 + 10x = 10x (5x+ 1)Hence, one of the factor of given polynomial is 10x.Question 15:The value of 2492 – 2482 is(a) 12   (b) 477   (c) 487   (d) 497Solution:(d) Now, 2492 – 2482 = (249 + 248) (249 – 248) [using identity, a2 – b2 = (a – b)(a + b)]= 497 x 1 = 497.Question 16:The factorization of 4x2 + 8x + 3 is(a) (x + 1) (x + 3)   (b) (2x+1) (2x + 3)(c) (2x + 3)(c) (2x + 2) (2x + 5)   (d) (2x -1) (2x – 3)Solution:(b) Now, 4x2 + 8x + 3= 4x2 + 6x + 2x + 3 [by splitting middle term]= 2x(2x+ 3) + 1 (2x+ 3)= (2x + 1)Question 17:Which of the following is a factor of (x+ y)3 – (x3 + y3)?(a) x2 + y2 + 2 xy   (b) x2 + y2 – xy   (c) xy2   (d) 3xySolution:(d) Now, (x+ y)3 – (x3 + y3) = (x + y) – (x + y)(x2-xy + y2)[using identity, a3 + b3 = (a + b)(a2 -ab+ b2)]= (x+ y)[(x+ y)2 -(x2 -xy+ y2)]= (x+ y)[x2+ y2+ 2xy- x2+ xy- y2][using identity, (a + b)2 = a2 + b2 + 2 ab]= (x+ y) (3xy)Hence, one of the factor of given polynomial is 3xy.Question 18:The coefficient of x in the expansion of (x + 3)3 is(a) 1   (b) 9   (c) 18   (d) 27Solution:(d) Now, (x + 3)3 = x3 + 33 + 3x (3)(x + 3)[using identity, (a + b)3 = a3 + b3 + 3ab (a + b)]= x3 + 27 + 9x (x + 3)= x3 + 27 + 9x2+27x Hence, the coefficient of x in (x + 3)3 is 27.Question 19:Solution:Question 20:Solution:Question 21:If a + b + c = 0, then a3+b3 + c3 is equal to(a) 0   (b) abc(c) 3abc(d) 2abcSolution:(d) Now, a3+b3 + c3= (a+ b + c) (a2 + b2 + c2 – ab – bc – ca) + 3abc[using identity, a3+b3 + c3 – 3 abc = (a + b + c)(a2 + b2 + c2 – ab – bc – ca)]Exercise 2.2: Short Answer Type QuestionsQuestion 1:Which of the following expressions are polynomials? Justify your answer,Solution:Question 2:Write whether the following statements are true or false. Justify your answer. "(i) A Binomial can have atmost two terms.(ii) Every polynomial is a Binomial.(iii) A binomial ipay have degree 5.(iv) Zero of a polynomial is always 0.(v) A polynomial cannot have more than one zero.(vi) The degree of the sum of two polynomials each of degree 5 is always 5.Solution:(i) False, because a binomial has exactly two terms.(ii) False, because every polynomial is not binomial .e.g., (a) 3x2 + 4x + 5 [polynomial but not a binomial](b) 3x2 + 5 [polynomial and also a binomial](Hi) True, because a binomial is a polynomial whose degree is a whole number greater than equal to one. So, it may have degree 5.(iv) False, because zero of a polynomial can be any real number e.g., p(x) = x – 2, then 2 is a zero of polynomial p(x).(v) False, because a polynomial can have any number of zeroes. It depends upon the degree of the polynomial.e.g., p(x) = x2 -2, a degree pf p(x) is 2 ,so it has two zeroes, it has two zeroes, i.e., √2 and – √2.(vi) False, because the sum of any two polynomials of same degree is not always same degree.e.g., Let f(x) = x4 + 2 and g(x) = -x4 + 4x3 + 2x.∴ Sum of two polynomials,f(x) + g(x) = x4 + 2 + (-x4 +4x3 + 2x)= 4x3 + 2 + 2 which is not a polynomial of degree 4.Exercise 2.3: Short Answer Type QuestionsQuestion 1:Classify the following polynomials as polynomials in one variable, two variables etc.(i) y3 – 5y(ii) xy+ yz + zxSolution:Polynomial y3 – 5y is a one variable polynomial, because it contains only one variable i.e., y.(ii) Polynomial xy+ yz+ zx is a three variables polynomial, because it contains three variables x, y and z.(iv) Polynomial x2 – 2xy + y2 +1 is a two variables polynomial, because it contains two variables x and y.Question 2:Determine the degree of each of the following polynomials.(i) 2x-1   (ii) -10[iii] x3 – 9x + 3x5   (iv) y3(1-y4)Solution:(i) Degree of polynomial 2x-1 is one, because the maximum exponent of x is one.(ii) Degree of polynomial -10 or -10x* is zero, because the exponent of x is zero.(iii) Degree of polynomial x3 – 9x + 3x5 is five, because the maximum exponent of x is five.(iv) Degree of polynomial y3(1-y4) or y3 – y7 is seven, because the maximum exponent of y is seven.Question 3:Solution:Question 4:Write the coefficient of x2 in each of the followingSolution:Question 5:Classify the following as a constant, linear, quadratic and cubic polynomialsThinking Process(i) Firstly check the maximum exponent of the variable.(ii) If the maximum exponent of a variable is 0, then it is a constant polynomial.(iii) If the maximum exponent of a variable is 1, then it is a linear polynomial.(iv) If the maximum exponent of a variable is 2, then it is a quadratic polynomial.(v) If the maximum exponent of a variable is 3, then it is a cubic polynomial.Solution:(i) Polynomial 2 – x2 + x3 is a cubic polynomial, because maximum exponent of x is 3.(ii) Polynomial 3x3 is a cubic polynomial, because maximum exponent of x is 3.(iii) Polynomial 5t -√7 is a linear polynomial, because maximum exponent of t is 1.(iv) Polynomial 4- 5y2 is a quadratic polynomial, because maximum exponent of y is 2.(v) Polynomial 3 is a constant polynomial, because maximum exponent of x is 0.'(vi) Polynomial 2 + x is a linear polynomial, because maximum exponent of x is 1.(vii) Polynomial y3 – y is a cubic polynomial, because maximum exponent of y is 3.(viii) Polynomial 1 + x+ x2 is a quadratic polynomial, because maximum exponent of t is 2.(x) Polynomial √2x-1 is a linear polynomial, because maximum exponent of t is 1.Question 6:Give an example of a polynomial, which is(i) monomial of degree 1.(ii) -binomial of degree 20.(iii) trinomial of degree 2.Solution:(i) The example of monomial of degree 1 is 5y or 10x.(ii) The example of binomial of degree 20 is 6x20 + x11 or x20 +1(iii) The example of trinomial of degree 2 is x2 – 5x+ 4 or 2x2 -x-1Question 7:Find the value of the polynomial 3x3 – 4x2 + 7x – 5, when x = 3 and also when x = -3.Solution:Let p(x) = 3x3 – 4x2 + 7x – 5At x = 3, p(3) = 3(3)3 – 4(3)2 + 7(3) – 5= 3×27-4×9 + 21-5= 81-36+21-5 P(3) =61At x = -3, p(3) = 3(-3)3 – 4(-3)2 + 7(-3) – 5= 3(-27)-4(9)-21-5 = -81-36-21-5 = -143 p(-3) = -143Hence, the value of the given polynomial at x = 3 and x = -3 are 61 and -143, respectively.Question 8:If p (x) = x2 – 4x + 3, then evaluate p(2) – p (-1) + p (½).Solution:Question 9:Find p(0), p (1) and p(2) for the following polynomials(i) p(x) = 10x – 4x2 – 3 (ii) p(y) = (y + 2)(y – 2)Solution:(i) Given, polynomial isp(x) = 10x – 4x2 – 3Now, put x = 0 in given polynomial, we get p(0)=0-0-3 = -3At p(1) = 10(1)-4(1)2 -3= 10-4-3= 3and p(-2) = 10 (-2)- 4 (-2)2 -3= -20-4×4-3 = -20-16-3= -39Hence, the values of p(0), p(1) and p(-2) are respectively, -3,3 and – 39.(ii) Given, polynomial isp(y) = (y+2)(y-2)On putting y =0,1 and -2, respectively in Eq. (ii), we get p(0)= (0+2)(0-2)= -4p(1) = (1 + 2)(1-2)= 3 (-1) = -3and p(-2) = (-2 + 2)(-2 -2)= 0Hence, the zeroes of p0(x),p(1) and p(-2) are respectively,-4,-3 and 0Question 10:Verify whether the following are true or false.(i) -3 is a zero of x+ 3(ii) -1/3 is a zero of 3x+1(iii) -4/5 is a zero of 4-5y(iv) 0 and 2 are the zeroes of t2 – 2t(v) -3 is a zero of y2 + y-6Solution:Question 11:Find the zeroes of the polynomial in each of the following,(i) p(x) = x – 4   (ii) g(x) = 3 – 6x(iii) q(x) = 2x – 7   (iv) h(y) = 2ySolution:(i) Given, polynomial isp(x)= x- 4For zero of polynomial, put p(x) = x-4 = 0=>x= 4Hence, zero of polynomial is 4.(ii) Given, polynomial isg(x) = 3-6xFor zero of polynomial, put g(x) = 03-6x = 0 => 6x = 3 => x=1/2.Hence, zero of polynomial is X(iii) Given, polynomial is g(x) = 2x -7 For zero of polynomial, put g(x)= 03-6x= 0 => 6x =3 => x=1/2.Hence, zero of polynomial is X(iv) Given, polynomial isg(x) = 3-6xFor zero of polynomial, put q(x) = x-4 = 0=>x= 4Hence, zero of polynomial is 4.Question 12:Find p(0), p(1) and p(2) for each of the following polynomials.(i) p(x) = x2 – x + 1   (ii) p(y) = 2 +y + 2y – y2(iii) p(x) = x3   (iv) p(x) = (x – 1)(x + 1)Solution:Question 13:By actual division, find the quotient and the remainder when the firstpolynomial is divided by the second polynomial x4 + 1and x -1.Solution:Question 14:By remainder theorem, find the remainder when p(x) is divided by g(x)(i) p(x) = x3 – 2x2 – 4x – 1, g(x) = x + 1(ii) p(x) = x3 – 3x2 + 4x + 50, g(x)= x – 3(iii) p(x) = 3x2 – 12x2 + 14x -3, g(x)= 2x – 1 – 1(iv) '(viii) p(x) = x3 -6x2+2x-4, g(x) = 1 -(3/2) xSolution:Question 15:Check whether p(x) is a multiple of g(x) or not(i) p(x) = x3 – 5x2 + 4x – 3, g(x) = x – 2.(ii) p(x) = 2x3 – 11x2 – 4x+ 5, g(x)= 2x + 1Thinking Process(i) Firstly, find the zero of g(x) and then put in p(x) and simplify it.(ii) If p(a) = Q then p(x) is a multiple of g(x) and f(p(a) # Q then p(x) is not a multiple of g(x) where 'a' is a zero of g (x).Solution:Question 16:Show that,(i) x + 3 is a factor of 69 + 11x- x2 + x3.(ii) 2x – 3 is a factor of x + 2x3 -9x2 +12Solution:Question 17:Determine which of the following polynomial has x – 2a factor (i) 3x2 + 6x – 24 (ii) 4x2 + x – 2Solution:Question 18:Show that p -1 is a factor of p10 -1 and also of p11 -1.Solution:Let p (p)= p10 -1 and also of p11 -1.Since, p(x) is divisible by (x+2), then remainder = 0P(-2) => (-2)3 -2m(-2)2 + 16=0=> -8-8m+16=0=> 8+8m = 0 => m = 1Hence, the value of m is 1.Question 20:If x – 2a is a factor of x5 -4a2x3 + 2x + 2a +3,then find the value of a.Solution:Let p(x)=a5 -2mx2 +16 divisible by x + 2?Solution:Let p(x) = x3 -2mx2 +16Since, p(x) is divisible by (x+2), then remainder = 0P(-2) => (-2)3 -2m(-2)2 + 16=0=> -8-8m+16=0=> 8+8m = 0 => m = 1Hence, the value of m is 1.Question 21:Find the value of a, so that 2x -1 be a factor of8x4 +4x3 -16x2 +10x+07.Solution:Question 22:If x +1 is a factor of ax3 +x2 -2x +4a -9,then find the value of a.Solution:Let p(x)= ax3 +x2 -2x + 4a – 9Since, x +1 is a factor of p(x), then put p(-1)=0=> a(-1)3 + (-1)2 -2(-1) + 4a – 9 = 0=> -a+1 +2+4a-9 = 0=> 3a -6=0 =>a = 2Hence, the value of a is 3/2.Question 23:Factorise(i) x2 + 9x +18   (ii) 6x2 +7x -3(iii) 2x2 -7x.-15   (iv) 84-2r-2r2Solution:Question 24:Factorise(i) 2x3 -3x2 -17x + 30   (ii) x3 -6x2 +11 x-6(iii) x3 +x2 – 4x – 4   (iv) 3x3 – x2 – 3x +1Thinking Process(i) Firstly, find the prime factors of constant term in given polynomial.(ii) Substitute these factors in place of x in given polynomial and find the minimum factor which satisfies given polynomial and write it in the form of a linear polynomial and other is a quadratic polynomial.(iv) Further, determine the factor of quadratic polynomial by splitting the middle term.Solution:Question 25:Using suitable identity, evaluate the following(i) 1033   (ii) 101 x 102   (iii) 9992Thinking ProcessFirstly,adjust the given number into two number such that one is a multiple of 10 and use the proper identity.Solution:Question 26:Factorise the followingSolution:Question 27:Factorise the following(i) 9x2 -12x+ 3   (ii) 9x2 -12xy +4Solution:Question 28:Expand the following(i) (4a-b + 2c)2   (ii) (3a – 5b – c)2(iii) (-x + 2y-3z)2Solution:Question 29:Factorise the following(i) 9x2 +4y2 + 16z2 +12xy-16yz -24xz(ii) 25x2 + 16y2 + 422 – 40xy + 16yz – 20xz(iii) 16x2 + 4y2 + 9z2 – 16xy – 12yz + 24xzSolution:Question 30:If a + b + c = 9 and ab + bc + ca = 26, find a2 + b2+c2.Solution:Question 31:Expand the following(i) (3a- 5b – c2)2Solution:Question 32:Factorise the followingSolution:Question 33:Find the following products(i) (x2 – 1)(x2 +1)(x4 +1)Solution:Question 34:Factorise(i) 1 + 64x3   (ii) a3 -2√2b3Thinking Process(i) Firstly, adjust the given number either in the form of a3 + b3 or a3 -b3(ii) Further, use any of the identities i.e., a3 + b3 =(a+b)(a2-ab+b2) and a3 -b3 =(a-b)(a2 +b2 + ab), then simplify it, to get the factor.Solution:Question 35:Fi nd (2x -y + 3z) (4x2 + y2 + 9z2 + 2xy + 3yz – 6xz).Solution:Question 36:Factorise(i) a3 -8b3 -64c3 -2Aabc(ii) 2√2a3 +8b3 -27c3 +18√2abcThinking Process(i) Firstly, adjust the given number into the form of a3 + b3 + c3 – 3abc= (a + b + c)(a2 +b2 + c2 – ab – bc-ca)Also, if a = b = c = 0, then a3 + b3 + c3 = 3abcHere, we know that,(x-2y) +(2y -3z)+ (3z-x) =0Therefore, (x-2y)3 +(2y-3z)3 +(3z-x)3 = 3(x-2y)(2y-3z)(3z-x).Question 37:What actually calculating the cubes, find the value of 36xy-36xy = 0?Thinking ProcessIn this method firstly check the values of a + b+ c, then . if a + b+c = 0, then use the identity a3 + b3 + c3 = 3abc.Question 38:Without finding the cubes, factorise the (x-2y) +(2y-3z) +(3z-x)=0Therefore, (x-2y)3 +(2y-3z)3 +(3z-x)3 = 3(x-2y)(2y-3z)(3z-x).Question 39:Find the value of(i) x3 +y3 -12xy + 64,when x+y = -4.(ii) x3 -8y3 -36xy-216,when x = -2ySolution:Question 40:Give possible expression for the length and breadth of the rectangle whose area is given by 4a2 +4a – 3.Solution:Given, area of rectangle = 4a2 + 6a-2a-3=4a2 [by splitting middle term]= 2a(2a + 3) -1 (2a + 3) = (2a – 1)(2a + 3) Hence, possible length = 2a -1 and breadth = 2a + 3Exercise 2.4: Long Answer Type QuestionsQuestion 1:If the polynomials az3 +4z2 + 3z-4 and z3-4z + o respectively , when divided by z – 3 leave the same remainder. Now, adjust the given polzis such a way that it becomes the product of two factors, one of them is a linear polynomial and other is a quadratic polynomial.(iv) Further, determine the factor of quadratic polynomial by splitting the middle term. Solution:Question 2:The polynomial p(x)=x4 -2x3 +3x2 -ax+3a-7 when divided by x+1 leaves the remainder 19. Find the values of a. Also, find the remainder when p(x) is divided by x+2.Solution:Let p(x) = x4 -2x3 +3x2 -ax +3a-7 When we divide p(x) by x+1, we get the remainder p(-1)Thus, p (-1) = (-1)4 -2(-1)3 + 3(-1)2 -a(-1) + 3a -7= 1 + 2 + 3 + a + 3a – 7 = 4a – 1 According to' the question, the remainders are same.p(1)3= p(2)3(27a+4+1 + 15+a27a+4 = 15-41 .26a = 26 a= -1Question 2:The polynomial p(x)= x4 -2x3 +3x2 -ax+3a-7 when divided by x+1 leaves the remainder 19. Find the values of a. Also, find the remainder when p(x) is divided by x+2.Solution:Question 3:If both x – 2 and x – (1/2) are factors of px2 + 5x+r, then show that p = r.Solution:Question 4:Without actual division, prove that 2x4 – 5x3 + 2x2 – x + 2 is divisible by x2-3x+2Thinking Process(i) firstly, determine the factors of quadratic polynomial by splitting middle term.(ii) The two different values of zeroes put in biquadratic polynomial.(iii) In both the case if remainder is zero, then biquadratic polynomial is divisible byquadratic polynomial.Solution:Let p(x) = 2x4 – 5x3 + 2x2 – x + 2 firstly, factorise x2-3x+2.Now, x2-3x+2 = x2-2x-x+2 [by splitting middle term]= x(x-2)-1 (x-2)= (x-1)(x-2)Hence, 0 of x2-3x+2 and 2.We have to prove that, 2x4 – 5x3 + 2x2 – x + 2 is divisible by x2-3x+2 i.e., to prove that p (1) =0 and p(2) =0Now, p(1) = 2(1)4 – 5(1)3 + 2(1)2 -1 + 2 =2-5+2-1 + 2 = 6-6=0and p(2) = 2(2)4 – 5(2)3 + 2(2)2 – 2 + 2 = 2x16-5x8+2x4+0 = 32 – 40 + 8 = 40 – 40 =0Hence, p(x) is divisible by x2-3x+2.Question 5:Simplify (2x- 5y)3 – (2x+ 5y)3.Solution:(2x- 5y)3 – (2x+ 5y)3= [(2x3 – (5y)3 – 3(2x)(5y)(2x – 5y)]-[(2x3 + (5y)3 + 3(2x)(5y)(2x+5y)]= -250y3 -120xyQuestion 6:Multiply x2 + 4y2 + z2 + 2xy + xz – 2yz by (-z + x-2y).Solution:Question 7:Solution:Question 8:If a+b+c = 5 and ab+bc+ca =10, then prove that a3 +b3 +c3 – 3abc = -25.Solution:All Chapter NCERT Exemplar Problems Solutions For Class 9 maths-

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