

MATEMÁTICAS -- 3º ESO -- IES EDUARDO JANEIRO

Worksheet 4 - Polynomials and equations

19-1-2015

Name:

Estos ejercicios se entregarán el día del examen sobre una puntuación máxima de 1 punto. Si se entregan pasada dicha fecha, la puntuación máxima será de 0.5 puntos.

1) Reduce:

a) $-3x^5 + 2x^5 - 7x^5$

b) $x^5 + x^4 - 3x^5 - 2x^4$

c) $x^6 \cdot (3x^2)$

d) $(-8x^2y) \cdot (-4xy^3)$

e) $((2x^5)^2)^3$

f) $\frac{30x^7}{5x^3}$

g) $(-54x^3y^2) : 9xy^2$

h) $\frac{81x^4y^3}{54x^2y^2}$

2) Contesta a las siguientes preguntas:

a) ¿Cuál es el polinomio de grado 2, con término independiente igual a -3 y con los coeficientes de grado 1 y 2 iguales a 7?

b) ¿Qué grado tiene el polinomio $P = x^4 - 3x^3 + 5x - 7$?

c) ¿De cuántos términos está compuesto?

d) ¿Es completo? Justifícalo.

3) Evaluate these polynomials:

a) $x^2 + x - 2$ when $x = 3$.

b) $2\pi r$ when $r = 2$.

c) $x^3 - 3x^2y + 3xy^2 - y^3$ when $x = 2$ e $y = -1$

d) $\frac{(3x-y) \cdot (5x+7y)}{(x-3) \cdot (2-y^2+3x)}$ when $x = -1$ e $y = -2$

4) Given: $P = x^5 - 5x + 1$; $Q = x^4 + x^3 - x - 1$; $R = x^6 + x^5 - x^3 + 2x^2 + 7x + 3$. Calculate:

a) $P + Q$

c) $-P - 3Q + R$

b) $P - Q$

d) $P \cdot Q$

5) Calculate these products of polynomials:

a) $2x^2 \cdot (x^4 - 3x^3 + 5x - 7)$

b) $(2x+1) \cdot (5x-2)$

c) $(x^2 - 3x + 1) \cdot (x^2 - 5)$

d) $(x-7) \cdot (x^2 - 3x - 2) \cdot (-2x+5)$

6) Take factors out:

a) $9x^2 - 3x$

d) $4x^2 - 12xy + y^2$

f) $20a^4b^2c + 36a^2b^3$

b) $81x^2 - 49$

e) $18x^3y^2 - 12x^2y^3$

c) $16x^6 + 8x^5 - 4x^3 + 6x^2$

7) Desarrolla, sin operar, las siguientes igualdades notables:

a) $(x+2y)^2$

d) $(-3x^3 - 7)^2$

b) $(3x-2)^2$

c) $(2x-5) \cdot (2x+5)$

8) Expresa como un producto notable los siguientes polinomios:

- a) $x^2 + 8x + 16$
- b) $4x^2 - 12x + 9$
- c) $x^4 - 49$
- d) $x^2 + 4xy + 4y^2$

9) Answer these questions:

- a) If the degree of a polynomial P is 6 and of another polynomial Q is 5, what is the degree of the polynomial P + Q?
- b) Write a binomial and a trinomial whose addition is a monomial.

10) Which of the following equations are equivalents?

- a) $3x + 1 = 0$ 1) $x + 5 = 11 - 2x$
- b) $x + 3 = 9 - 2x$ 2) $2x - 9 = 5x - 18$
- c) $3x - 9 = 6x - 18$ 3) $4x + 2 = x + 1$

11) Look for the solutions of these equations:

a) $7(13 - 2x) = x + 4(12 + 3x)$

b) $5(2x + 3) - 4(2 - 3x) = 2(2 + 3x)$

c) $\frac{1-x}{2} - \frac{3}{5} = \frac{4}{3} - \frac{x+2}{6}$

d) $\frac{x}{3} - \frac{x-3}{6} + 1 = \frac{x+2}{4} - \frac{1}{2}$

e) $x + \frac{1-3x}{5} + \frac{3}{4} = \frac{2x}{5} + 1$

f) $\frac{3x}{2} - \frac{x+1}{3} = 4$

g) $\frac{3x-5}{2} = \frac{3(3x-1)}{5}$

h) $2x + \frac{x+5}{6} - \frac{3(x+4)}{8} = 7 - 3x$

i) $6\left(\frac{x+1}{8} - \frac{2x-3}{16}\right) = 3\left(\frac{3}{4}x - \frac{1}{4}\right) - \frac{3}{8}(3x-2)$

12) At a community meeting there are double the number of women than men and triple number of children than the total of men and women combined. How many men, women and children are there if 96 people attend the meeting?

13) A farm has pigs and turkeys. In total, there are 35 heads and 116 paws. How many pigs and turkeys are there on the farm?

14) Peter went on a road trip, during which time 20 liters of gasoline were consumed. However, he completed the trip in two stages. In the first, he consumed $\frac{2}{3}$ of the gasoline that was in the tank and in the second stage, half of the gasoline that he had left in the tank.

- a) Determine the number of liters of gasoline that were in the tank before the trip.
- b) Determine the number of liters consumed at each stage.

15) In a bookstore, Anne buys a novel with a third of her money and a comic with two-thirds of what remained. When she left the bookstore, she had \$12. How much money did Anne have before arriving at the store

16) If the double of a number is subtracted by its half and the result is 54. What is the number?

17) Mi hermano tiene 6 años y yo tengo 15. Si mi padre tiene 41 años, ¿dentro de cuántos años será la suma de la edad de mi hermano y mía igual a la edad de mi padre?

18) Un comerciante ha mezclado 20 kg de café barato y 10 kg de café caro, obteniendo así un café mezclado a 2 €/kg ¿Cuánto costaba cada tipo de café si sabemos que el más caro valía cuatro veces

más que el más barato?

- 19) A trader has two types of oil; the first is \$40/kg and the second, \$60/kg. How many kilograms of each type of oil must be mixed together to get 60 kilograms of a mixture that would cost \$50/kg?
- 20) Two cities, A and B are located 300 miles from each other. At 9 am, a car leaves City A with a speed of 90 mph and travels towards City B. At the same time, a car leaves City B travelling towards City A with a speed of 60 mph. Find:
- a) The time it takes for the cars to pass each other.
 - b) The time at which they passed each other.
 - c) The distance traveled by each at the time of them passing each other.