Ejercicios resueltos distancias died

1. PHYSICS SOLVED THE PROBLEMS. PROFESSOR JOEL MEAURIS GELABERT S. SUBJECT I. SCIENTIFIC NOTATION AND SURGERY. Scientific notation: this is a method created by scientists to facilitate work and operations with very large or very small amounts. To correctly express the amount in scientific notation, we must observe where the point and where it should be placed given that the amount written to the point should be the number more than zero and less than ten, and that if the number of decimal number with zero in the whole part, the power figure of ten is negative. Examples. It expresses itself in the scientific notation of the following number 1. The 65,000,000 x 6.5x107 point is in the middle of 6 and 5 and the number of places between the end point and the point that was placed is the number 2. 589,000,000,000 x 5.89x1011 3. 125 000 000 x 1.25x108 4. The 0.000,000,00035 x 3.5x10-10 in this case the figure is negative, because the amount we want to express is a decimal number that has a generally zero portion. 5. 0.000,000,000,000,000578 x 5.78x10-14 Scientific notation operations. To add or subtract the number in the scientific notation exhibitors must be equal, and in case they do not we have to match them, given that if we move the point to the left the exhibitor increases one for each place traveled, and if it moves to the right subtracted from the exhibitor. Examples. 1. (500x104) (8x106) move point 500 two places to the left to match exhibitors. (5x106) (8x106)-13x106now we move the point back to the left because 13 is larger than 9, and one is added to the exhibitor. 1.3x107 2. (4.5x105) (3.7x104) option is to move the point of the first amount in the right to subtract one of the exhibitor and equal it to 4. (45x104) (3.7x104) x 48.7x104 moves the point to the left and adds one to the exhibitor. 4.87x105 (94.6x104)-(3.2x105) ? (9.46x105) --(3.2x105) - 6.26x105 Joel Omauris Gelabert S. 2. Multiplying and dividing in scientific notation. Multiplication. When we reproduce in scientific notation, we should only add exhibitors and express the result in accordance with the standards of scientific notation. Examples. 1. (4x103)(7x105)-28x108-2.8x109 2. (2.34x102) (15.2x107) x 35.568x109 in these exercises we move the point to the left and add one to the exhibitor. 3.5568x1010 3. (0.48x107) (7.5x104) s 3.6x1011 Division. When the number is divided into scientific notation, numerical coefficients of authority are divided and exhibitors are subtracted. Examples. 1. 2. 45x10 12 3x10 8 29x10 9 8x10 4 x 15x1012- 8 x 15x104 x 1.5x105 x 3.625x109- 5 x 3.625x104 Power. To find the power of power, it rises to power, given the numerical base ratio and exhibitors multiply. Examples. 1. (3x104)2 x 32x104 x2 x 9x108 2. (8x10-3)3 x 83x10-3x3 x 512x10-9 x 5.12x10-7 3. (4x105)4 256x1020 x 2.56x1022 Joel Meauris Gelabert S. 3. ITEM II. CHANGE OF UNITS. Important equivalence. 1 meter x 100cm One inch x 2.54 cm 1 kilometer x 1000 meters One mile x 1609 meters. 1 meter x 39. 37 inches 1 kilogram x 1000 grams. One pound 16 ounces. 1 foot x 12 inches. The exercises are resolved. 1. Convert 4.5 km to meters. 1 km x 1000 m to take from km to meter multiplied by 4.5 km x 4.5x1,000 m the amount of km per 1000. 4.5 km x 4500 meters. 2. Transforms 3200 meters to km 1000 m x 1 km 3200 m x 3200 m.km 1000 m to take from meter to km divides the number of meters by 1000. 3.2 km 3. Turn the day into minutes. 1 day x 24 hours. 1 hour x 60 minutes 1 day x 24x60 minutes 1 day x 1440 minutes. 4. Conversion of 16 kg to g. 1 kg x 1000 grams 16 kg x 16 x 1000 grams 16 kg x 16000 grams. 5. Conversion 45 inches per cm. One inch x 2.54 cm 45 inches x 45 (2.54cm) 45 inches x 114.3 cm. Joel Amauris Gelabert S. 4. ITEM III. CORNER MEASURING SYSTEMS. Sex and radial system. Equivalence between the two systems. 1. L x 2orad 2. 360 0 2 x 1 rad x l x 2-rad 2-rad 360 (10) 2-360 180 0 10 -π-2-rad 360 π 180 Express in Radians: 1. 600 Solution π 60o 60 (rad) glad (divided all by 60) 180 180 600 x π 3 glad 2. Express in the sexagesimal solution: 2 x rad 3 2 x 180 0 3 x 3 x 3 π x 360 0 π 3rd rad x 1200 Joel Amauris Gelabert S. 1200 rad 5. POINT IV. Mechanical. Even direct movement. This is the type of movement in which equal distances are overcome at equal times. Troubleshooting. 1. The car moves at the same speed at 100 km/h in 5 hours. d Data: v, then: t V-100 km/h 1. d-v.t T-5 h d- (100 km/h) (5 h) D?? 500 km. 2. 500 x1,000 m. 5000 m. 3. 5,000x100 cm d. 500,000 cm 3. The plane passed 2940 km in 3 hours with a single movement. Calculate your speed in km/h, m/second and miles/h. Solution. d Data: v-t-t-3 hours. 2940 km d'2,940 km 1. V? 980 km/h 3 □ v? 2. 1 h x 60 min and 1 min with 60 sec: v x 2,940 (1000 m) 3 (60) (60 sec) with 2,940,000 m 10800 sec vs.272. 22 m/sec 3. 1 km x 0.621 miles, then: 2940 km x 2940 (0.621 miles) 2,940 km x 1825.74 miles, so: vs. 1825.74 miles 3h vs. 608.58 mph. Joel Amauris Helbert S 6. 4. Two cars are 5 km apart and running in the opposite direction with 40 km/h and 60 km/h. How long will it take to find each other? Solution. Data: as cars are found, their speeds are added to 5 km. v1 x 40 km/h d v2 x 60 km/h t? v 5 km 5 km t? t s 40 km/h 60 km/h 100 km/h t with 0.05 h with 0.05x60 min with 3 minutes 5. From Montecristi at 11 a.m. a single-traffic car to the city of La Romana starts at 60 km/h. At 13:00 another car starts in its pursuit from 100 km/h. Calculate at what time and at what distance from the starting point it will reach it. Solution. Data: Distance traveled The V1-60 km/h d-v.t vehicle and the second vehicle is d-v, (t-2h) V2-100 km/h, as it took off in 2 hours. You? D?? Correspondence expressions d-v.t and d-v, (t-2h) v, (t-2h) - v.t v, t-2hv, v.t v. t-v.t-v,2h t (v,-v)-v,2h we left that: t-t-v, 2□ v , v 100 km/h 2h 100 km/h -60 km/h s 200 km 40 km/h t-5 h. The first car drove 5 hours and departed in 11 hours, this means that the meeting time was at 16:00 Distance traveled during the meeting was: d.v.t. (60 km/h) (5 h) d. 300 km. Joel Amauris Gelabert S. 7. THE V THEME IS A DIVERSE MOVEMENT. This is the type of movement in which the speed is not constant. Problems solved. 1. The car has an initial speed of 20 m/s and 5 seconds later reaches the final speed of 40 m/s. What is its acceleration? Solution: vf ? vi a't Data: 40m/sec '20m/sec 20m/sec vi' 20m/sec a' s 5 sec 40m/sec. t'5 sec. a's 4m/sec2 a'? 2. The cyclist enters the track at an initial speed of 36 km/h and gains a acceleration of 0.5 m/sec2. The descent lasts 8 seconds. Calculates: the length of the slope and the speed of the cyclist during the journey. Solution. Data: A-0.5 m/sec2 36,000 m vi-36 km/h -10 m/sec 3600 sec t-8 sec 1 d? d'vite on 2 2 1 v? 1. (10 m/s) (8 sec) 0.5 m/sec2) (8 sec)2 2 m with 80 m (0.25 m/sec2) (64 sec2) d 80mh16m d.96m 2. vf s vi'at vf s 10 m/sec (0.5 m/sec2) (8 sec) vf x 10 m/sec.4 m/sec vf x 14 m/sec. 3. Calculates the final speed and distance traveled by the car, which comes from a rest with M.U.A., if after 15 seconds it has an acceleration of 4 m/s 2. Solution. vf 'vi Data: 1. a't vi' 0 vf's vi'at, but vi'0, so: t'15 sec vf's at 4 m/sec2 vf' (4 m/sec2) (15 sec) vf'? Vf? 60 m/sec? Joel Meauris Gelabert S. 8. 1 2. 2, but vi s 0. 2 1 d'o (4 m/sec2) (15 sec)2 2 d' (2 m/sec2) (225 sec2) d'450m THEME VI. Free-fall movement formulas. 1. vf s vi'gt 1 2. gt2 2 3. vf' vi 2 and 2g□ 4. T x 2h (if I saw 0) g Formula from vertical ascending shooting. 1. vf-vi-gt 1 2. h- vit- gt2 2 3. vf s vi2 x 2gh 4. hmax I saw 2 2g 5. Tsybida 5. Tuelelo VI g 2vi g Joel Meauris Gelabert S. 9. Troubleshooting. 1. The stone is thrown vertically downwards at an initial speed of 12 m/s, reaching the ground by 10 seconds. Calculate the height at which it was launched and the final speed at which the earth touches. Solution. Data: 1. vf?vi'gt vi-12m/sec vf-12m/sec (9.8m/sec2) (10sec t-10sec vf-12m/sec-98m/sec 2 g-9.8m/sec vf-110 m/sec?h?? Vf? 1 2. gt2 2 1 h (12 m/sec) (10 sec) (9.8 m/sec2) (10 sec)2 2 2) (100 sec2) h 120 m (4.9 m/sec h-120m/sec-490m h-610m 2. The body is thrown vertically up with 60m/sec. calculates the final speed and height of 3 seconds if it has been released. Solution: 1. vf-vi-gt t-3sec vf-(60m/sec)-(9.8m/sec2) (3sec) vi-60m/sec vf-60m/sec-29.4m/sec 2 g-9.8m/sec vf-30.6m/v?? H? 1 2. H gt2 2 1 h s (60m/sec) (3sec) - (9.8m/sec2) (3sec)2 h s 180m(a) 4.9m/sec2) (9seg2) h s 180m-44.1m h s 135.9m Calculate the maximum height at which the body reaches. hmax s hmax s vi 2 2g 60m/sec 2 3600m 2 /se g 2 x 2 (9.8m/sec2) (19.6m/sec 2) hmax x 183.67 m Ama Joeluris Gelabert S. 10. POINT VII. HORIZONTAL SHOOTING. HORIZONTAL SHOOTING FORMULAS. I saw two. Sep 2 ∅ 1. Hmax 2g 2. Tsybida 3. Tuelelo 4. Rmax (maximum height) vi . Sep ∅ g 2vi. Sen ∅ Mr. I saw 2. Sep 2∅ g (maximum range) 5. Viy vi.sen∅ (vertical speed) 6. 6. Vix-vi.cos∅ problems solved. 1. The bomb was dropped from an aircraft flying horizontally at a speed of 90 m/s at an altitude of 490 m. How long will the bomb last? And what horizontal distance does a bomb pass before falling to the ground? Solution. Data: 2h v x 90 m/sec 1. T s g h s 490 m T s 2(490 m) 980 m x 9.8 m/sec2 9.8 m/sec2 g s 9.8 m/sec2 T s 100 sec2 T x 10 sec 2. d-vi 2h and as g d' (90 m/sec) (10 sec) d s s 900 m Joel Meauris Gelabert S. 2h x 10 sec g 11. 2. The cannon fires a projectile at an initial speed of 150 m/s and a shooting angle of 600. Calculate: maximum altitude, flight time, vertical speed of 5 seconds and maximum horizontal range. Solution. Data: ∅ 600 vi s 150 m/s. T. 5 sec 1. Hmax Hmax Hmax VI 2 . Sep 2 ∅ 2g 150 m/sec 2 Sep 2 60 0 2 (9.8 m/sec 2) s (22,500 m 2 /sec 2) 0.86 2 19.6 m/sec 22 2500 m 2 /sec 2 (0.7396) 19.6 m/sec 2) with 16,641 m 2 /sec 2 19.6 m/sec 2) Hmax x 849.03 m 2. Tuelo-Tuelo-Twuelo-2vi. Sep ∅ g 2 (150 m/sec) Sep 60 0 9.8 m/sec 2,300 m/sec (0.86) 258 m/sec x 9.8 m/sec 2 9.8 m/sec 2 Twelio 26.32 sec. Vertical speed of 5 seconds 3. Viy s vi.sen∅ Viy (150 m/sec) (Sen 600) Viy (150 m/sec) (0.86) Viy x 129 m/sec 4. Rmax - Rmax - Rmax - vy - viy -gt vy -129 m/sec-(9.8 m/sec2) (5 sec) vy s 129 m/sec-49 m/sec vy s 80 m/sec vi 2 . Sep 2∅ g 150 m/sec 2 sec 2 (60 0) 9.8 m/sec 2 22500 m 2 /sec 2 sen (120 0) Joel Meauris Gelabert S. 9.8 m/sec 2 12. (22,500 m 2 /sec 2) (0.86) Rmax x 9.8 m/sec 2 x 19 350 m 2/sec 2 9.8 m/sec 2 Rmax x 1,974.48 m TEMA VIII. It is a type of movement that describes a particle at a constant speed. Problems solved. 1. The body weighing 20 kilograms rotates, tied to a rope 4 meters long, describing the circumference at a speed of 75 r.p.m. Calculates: 1. Angular speed in rad/sec 2. Linear speed. 3. Central acceleration 4. Centropetal force 5. His kinetic energy. Solution. Data: m s 20 kg r s 4 m x 75r.p.m 1. 75 (2-rad) 150'rad's 2.5'rad/sec 60 sec 60 sec 2. V.r v.r. (2.5.rad/sec) v . . . . ac s v2 r 10 π m/sec 2 100 π 2m 2/se g 2 x 5m 2m 2m 2/se g 2 5m x 4o 2m/sec2 4. FC s m. ac FcTM (20 kg) (4x2 m/sec2) Fc-80-2 Newton. Joel Meauris Gelabert S. 13. 1 5. Ec-mv2 2 Ec-2 (0.5) (20 kg) (100-2 m2/sec2) Ec-1000-2 jous. POINT IX. WORK AND ENERGY. Job: Work is defined as a product of power of power above the object and the distance that the force moves or moves the object. Mathematical equation of the job: W-f.d, although if the shift passes through the slope, the formula becomes w f.d Cos ∅ where the ∅ is the slope angle. The unit in which the work is measured is July. Troubleshooting. 1. Calculate the work done by the horse when using force 50 Newton moves the wagon 35 meters. Solution. Data: f-50N w-f.d-35m w-(50N) (35m) w?? 1750 josters. 2. The car is 100 kg of rest and 5 seconds later reaches the final speed of 40 m/s. Calculate the work done. Data: vi ? 0 vf ? 40 m/sec t ? 5 sec. W? Solution. In this case, we must first calculate the acceleration of the car. a-a-vf-vi t 40 m/sec-0-5 sec-a-8 m/sec2 Joel Manauris Gelabert S. 40 m/sec 5 sec 14. 2. Now we look at the distance traveled by the car. 1 d'vite at2 2 1 d' (0) (5 sec) (8 m/sec2) (5 sec)2 2 d'0 (4 m/sec2) (25 sec2) d'100 m 3. The power is calculated. 4. Finally, work: F-m.a F-(100 kg) (8 m/sec2) w-f. d w- (800 Newton) (100m) F-800 Newton. 80,000 jousters. Observation!!!! The aforementioned problem can also be solved by applying the theorem to a variation of kinetic energy. As according to this theorem the work is equal to: 1 w'm (vf2- vi2) 2 1 w' (100 kg) (40 m/sec)2-(0)2 w' (50 kg) (1600 m2/sec2) w' 80,000 Jous. 4. The man pushes the 50 kg field down the slope, the angle of which is 320 use of force 80 Newton. Calculate the work done by a man if he moved a field about 8 meters. Solution. Data: F-80 Newton w-f.d.Cos ∅ M-50 kg w-(80 N) (8 m) cos 320 ∅-320 w- (640 N.m) (0.848 W?? 542,72 jousters. Joel Meauris Gelabert S. 15. 5. Apply the theorem to a variation of kinetic energy and calculate the work done when in 8 seconds a car weighing 120 kg changes its speed from 20 m/sec to 30 m/s. Data: vi-20 m/sec vf-30 m/sec t-8 sec w?? Solution. 1 w'm (vf2- vi2) 2 w' 1 (120 kg) (30 m/sec)2-(20 m/sec)2 2 in' (60 kg) (900 kg)) 0 m2/sec2 - 400 m2/sec2) w (60 kg) (500 m2/sec2) w x 30,000 Jousters w x 3x104 jousters. Joel Meauris Gelabert S.S. ejercicios resueltos distancias diedrico

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