

HW19 - UNIT TEST

DATE: 09th february 2021

1 ALMACHE LITARDO ANDERSON MOISES

Pythagoras Theorem

Calculate the hypotenuse:

$$H^2=a^2+b^2$$

2 ALTAMIRANO BENALCAZAR CRISTHIAN ALEXANDER

7/10

Perimeter of a rectangle

$$P= 2*b + 2*h$$

2(base)	2(height)	Expected Result	Actual Result
10.2	6.5	33.4	
7	8	30	
19	13	64	
17	12	58	
20	15	70	
23	19	84	
28	20	48	

3 ALVAREZ RAMIREZ MICHELLE ESTEFANIA

10

Voltage calculation (Ohm's law)

$$Voltage = Intensity * Resistance$$

Intensity	Resistance	Expected Result	Actual Result
6	0	0	
2,3	20	46	
10	8	80	

200	9,8	1960	
0	15	0	
-5,7	23	-131,10	
20	5000	100000	
0	0	0	
-9,6	5,2	-49,92	
25	15	375	

4 ANDRADE CARATE ALAN DAMIAN

equation of time $t=d/v$

distance	speed	time
100m	35 m/s	2.85 s
50m	40 m/s	1.25 s
25m	50 m/s	0.5 s
10m	5 m/s	2 s
5m	10 m/s	0.5 s
1m	10 m/s	0.1 s

5 ANDRANGO ESPINOSA ALEX PAUL

6 ARROBA SOLORZANO CRISTIAN ALEXANDER

TEOREMA DE STEWART

$$d^2 \cdot c = m \cdot a^2 + n \cdot b^2 - m \cdot n \cdot c$$

7 ASUMAZA GUALOTO DYLAN ALEXANDER

9

Area of a regular polygon

$$A = P \cdot a/2$$

P(perimeter)	a(apothem)	$A = P \cdot a/2$	Actual Result
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30	4.1	61.5	
25	3.4	42.5	
28	2.2	30.8	
10	3.2	16	
25	7.7	96.25	
40	8.3	166	
33	4,4	72.2	
50	3,3	82.5	
44	2.6	57.2	

8 BRAVO RODRIGUEZ KATHERIN DAYANNE

7

Formula for Work

Formula:

Work = Force x Distance

$$W = F.d$$

Number	Force (newtons)	Distance (meters)	Expected result work (joules)	Actual result
1	72 N	14 m	1008 J	
2	80 N	20 m	1600 J	
3	120 N	16 m	1920 J	
4	15 N	9 m	135 J	
5	30 N	6 m	180 J	
6	50 N	26 m	1300 J	
7	65 N	35 m	2275 J	
8	8 N	2 m	16 J	
9	63 N	23 m	1449 J	
10	120 N	85 m	10200 J	

9 BRAVO VILLALOBOS CHRISTIAN DAVID

0

10 BUSTILLOS MONTENEGRO PABLO SEBASTIAN

7

mechanical energy

$$E_m = E_c + E_{+p}$$

Kinetic energy	potential energy potentialEnergy	Result
100 J	5880 J	5980 J
75 J	451 J	526 J
452 J	35 J	487 J
446 J	741 J	1187 J
32174 J	456 J	32630 J
3124 J	741 J	3865 J
214 J	45 J	259 J
123 J	741 J	864 J
745 J	842 J	1587 J

11 CADENA ROMAN BENJAMIN ABEL

0

12 CAISATOA RAMIREZ SEBASTIAN BERNARDO

10

Distance between two points

pointA (x1,y1,z1)	pointB (x2,y2,z2)	Result $ \overrightarrow{BC} = \sqrt{(c_1 - b_1)^2 + (c_2 - b_2)^2 + (c_3 - b_3)^2}$
(-1,0,4)	(1,-2,-3)	7,54
(3,4,2)	(2,5,4)	2,44
(4,-2,1)	(-4,-3,-7)	11,35
(-3,-6,-5)	(4,6,9)	19,72
(4,6,3)	(-7,5,6)	11,44
(9,4,5)	(4,-6,-2)	13,19

(2,4,1)	(3,2,4)	3,74
(5,8,2)	(8,7,4)	3,74
(2,-9,-4)	(6,7,4)	18,33

13 CALDERON MERCHAN ANDY JOSUE

8

ACCELERATION FORMULA

F(force)	M(mass)	acceleration (m/s ²)
50N	110Kg	0,45
100N	90Kg	1,22 m/s ²
20N	50Kg	0,4 m/s ²
220N	70Kg	3,14 m/s ²
500N	60Kg	8,33 m/s ²
25N	5Kg	5 m/s ²
350N	25Kg	14 m/s ²
700N	550Kg	1,27 m/s ²
30N	0,15 Kg	200 m/s ²

14 CORREA RUIZ KERLY YADIRA
pressure

10

Test Case for compute Pressure (float,float)

$$P=F/A$$

force	area	Expected result	Actual Result
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14.2	14.5	0.9793	
23.5	19.4	1.2113	
16.2	20.3	0.79803	
22.1	32.6	0.6779	
23.1	10.6	2.1792	
8.4	25.6	0.3213	
6.9	21.4	0.3224	
32.4	15.2	2.1316	
13.4	14.6	0.9178	
9.9	22.2	0.4459	

15 CRUZ PANTOJA DARLING MICAELA

8

Electrical Power Formula			
$P = V * I$			
Voltage	Current	Power Result	Actual Result
20	9	180	
17	5,67	96,39	
16,23	4,28	69,4644	
12	8,78	105,36	
-8,65	3,14	-27,161	
5,22	7,25	37,845	
4	2	8	
2,3	1,2	2,76	
1,6	4,8	7,68	
0	2,67	0	

16 DE LA CRUZ QUINGA ALEJANDRO
SEBASTIAN
Triangle Area

10

base	height	Area (expected result)	Actual result
4.56	852.22	1943.06	
40485.2	52.00	1052615.2	
523.20	526.3	137680.08	
-4502.05	2589.00	-5827903.725	
4528280.63	-98524.4	-2.2307 * 10 ⁽⁻¹¹⁾	
545698.0	-0.25896	-70656.97704	
54365.52	20.5	557246.58	
-98505.36	-98752.55	4863827744	
-9875.00	0.2582	-1274.8625	
8582.528	28.00	120155.392	

17 EIVAR DAGUA JAIME MAURICIO

10

CALCULATION OF FORCE

$$F=mx a$$

mass(Kg)	acceleration(m/s ²)	Force=mx a(N)
89	9,9	88,11
78	12	936

1	18	18
0,000000789	0	0
935134,98943	-2	-1870269,979
11	98641,123	1085052,353
98962	98	9698276
1000000	1000	1000000000
123456	64211,12	7927248031

18 GARCIA BARRETO MAYERLY PRISSILLA

9

$$A = \pi * r^2$$

where

$$\pi = 3.1415$$

r = radius

A = area

Circle Area

π XXXXXXXX	radio	$A = \pi * r^2$
3.1415	2	12.566
3.1415	1	3.1415
3.1415	0.5	0.7853
3.1415	8	20.,056
3.1415	16	804.224
3.1415	4	50.264
3.1415	1,54	7.45
3.1415	5	78.5375
3.1415	6	113.094

19 GOMEZ DIAZ MELISSA MALAYCA

7

SECTOR OF A CIRCLE

$$A = \frac{\pi * r^2 * \alpha^\circ}{360^\circ}$$

Radius (R)	Angle (α°)	$A = \frac{\pi * r^2 * \alpha^\circ}{360^\circ}$
1	30°	0.262 m ²
24	42°	211.12 m ²
60	94°	2953.1 m ²
15	43°	84.43 m ²
8	16°	8.94 m ²
32	129°	1152.76 m ²
45	335°	5919.94 m ²
19	36°	113.41 m ²
5	50°	10.91 m ²
26	120°	707.91 m ²

Calculation of Distance of a projectile

Time [second]	Speed[m/s]	=Distance [m] [v*t]	Expected Result	Actual Result
10000 [s]	3.248 [m/s]	3248 [m]	3248	
1050 [s]	25.8 [m/s]	27090 [m]	27090	
400[s]	60.900 [m/s]	24360 [m]	24360	
100 [s]	72.584 [m/s]	7258.4 [m]	7258.4	

80 [s]	-25.25 [m/s]	-2020 [m]	-2020	
40 [s]	10.20 [m/s]	408 [m]	408	
10 [s]	9.81 [m/s]	98.1 [m]	98.1	
-20 [s]	-14.56 [m/s]	291.2 [m]	291.2	
-22.25255 [s]	-25.852 [m/s]	575.2729226 [m]	575.2729226	
-42.2558 [s]	-0.1 [m/s]	4.22558 [m]	4.22558	

Ecuación de Onda

$$Y = A * \sin(\omega t + kx)$$

	t(s)	x(m)	Expected Result $2 * \sin(2\pi 1000t + 20x)$	Actual Result
1	22	17	1.30062148	
2	0	74	-0.609850917	
3	59	8	0.438850517	
4	48	-99	-1.430005777	
5	23	40	1.787939296	
6	33	-22	-0.352210587	
7	5	-34	-1.976081844	
8	46	37	-1.976044645	
9	6	84	1.366303308	
10	60	-100	-1.860079009	

Einstein Equation $E=mc^2$

Mass (kg)	c^2 (m/s) ²	Expected Result (J)	Actual Result
9.109×10^{-28}	$(3 \times 10^8)^2$	8.1981×10^{-11}	
9.11×10^{-31}	$(3 \times 10^8)^2$	8.1990×10^{-14}	
0	$(3 \times 10^8)^2$	0	
1	$(3 \times 10^8)^2$	9.0000×10^{16}	
10	$(3 \times 10^8)^2$	9.0000×10^{17}	
25	$(3 \times 10^8)^2$	2.2500×10^{18}	
50	$(3 \times 10^8)^2$	4.5000×10^{18}	
100	$(3 \times 10^8)^2$	9.0000×10^{18}	
1000	$(3 \times 10^8)^2$	9.0000×10^{19}	
1857	$(3 \times 10^8)^2$	1.6713×10^{20}	

Volume of the spherical sector with 2 bases

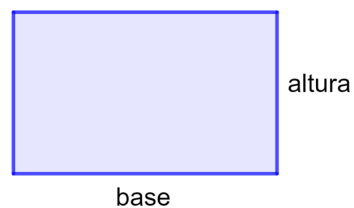
$$v = \frac{\pi h(3r_1^2 + 3r_2^2 + h^2)}{6}$$

r1	r2	h	Expected Result	Actual Result
2	3	1.5	57.1377	
3	4	2	229.3362	
0.4	0.6	1	0.8168	
0.6	1.2	5	285.5707	
54	23	19	5786523.	

			071	
11	2	5	1735.729 9	
200	93	121	2.40757 $\times 10^{10}$	
0.1	2	0.5	0.7932	
15	4	7	11094.53 44	
13342	3412	654	5.11548 $\times 10^{15}$	

24 LANDAZURI SEGOVIA MATEO ISRAEL

AREA OF THE RECTANGLE



$$A = \text{Base} \times \text{Altura}$$

BASE	HEIGHT	Expected Result	Actual Result
1.2	0.80	0.96	
4.5	3.75	16.875	

5.6	4.49	25.144	
7.8	6.68	52.104	
20.1	10.2	205.02	

25 LINCANGO CRIOLLO JOSE DANIEL

10

Calculate the speed

DISTANCE(m)	WEATHER(s)	Operation	Expected Result (m/s)	Actual Result
10.5	5	10/5	2.1	
8.3	2.7	8/2	3.07	
16.4	8.9	16/8	1.84	
20.1	7	20/12	2.87	
13	4	13/4	3.25	
23	11.5	23/11	2	
14.2	9	14.2/9	1.55	
60.5	20.3	60.5/20.3	2.9	
50.6	6.6	50.6/6.6	7.66	

26 MAISINCHO PAUCAR RICAR ALEXANDER

6

Parallel Resistors

$$R_{eq} = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \dots + \frac{1}{R_n}}$$

R1 (ohm)	R2(ohm)	Rt (ohm)
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10.2	15	6.07
20	40.6	4.6
13	2	1.733
100	500	83.33333
200	200	100
25	10	7.14

27 MALDONADO BASTIDAS MATEO STEFANO

10

Volume of a cone

Radio(r)	Height(h)	π	$V = (\pi * r^2 * h) / 3$	Expected Result
1.5	4.7	3.1416	$(3.1416)(1.5)^2(4.7)/3$	4.188
3.5	2.8	3.1416	$(3.1416)(3.5)^2(2.8)/3$	37.699
2	5.6	3.1416	$(3.1416)(2)^2(5.6)/3$	23.457
5.5	6	3.1416	$(3.1416)(5.5)^2(6)/3$	190.066
7	3.56	3.1416	$(3.1416)(7)^2(3.56)/3$	182.673
4	8	3.1416	$(3.1416)(4)^2(8)/3$	134.041
2.4	3	3.1416	$(3.1416)(2.4)^2(3)/3$	15.566
6	4	3.1416	$(3.1416)(6)^2(4)/3$	150.796

28 MANTUANO FERNANDEZ LEONEL FERNANDO

1

Volumen de una esfera

29 MORALES CAICEDO ANTHONY JAVIER

5

Quadratic equation

$$ax^2 + bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Equation	Value of a	Value of b	Value of c	Expected result	Actual result
$x^2 + 2x - 63 = 0$	1	2	-63	$x_1 = 7.21$ $x_2 = -9.23$	
$7x^2 - 13x - 1 = 0$	7	-13	-1	$x_1 = \frac{13 + \sqrt{197}}{4}$ $x_2 = \frac{13 - \sqrt{197}}{4}$	
$5x^2 + 12x = 0$	5	12	0	$x_1 = 0$ $x_2 = -2.4$	
$6x^2 - 19x + 10 = 0$	6	-19	10	$x_1 = 2.5$ $x_2 = 0.66$	
$x^2 + 7x = 0$	1	7	0	$x_1 = 0$ $x_2 = -7.1$	

Calculation percentage of budget execution = Total Executed/Total Budget

Butget	Executed	Expected Result	Actual Result
5.000,00	4.870,00	97,40%	
1.000.000,00	805.000,00	80,50%	
70.000,00	20.000,00	28,57%	
15.000,00	12.000,00	80,00%	
4.500.000,00	4.200.000,00	93,33%	

30.000,00	5.000,00	16,67%	
500.000,00	650.000,00	130,00%	
2.670.000,00	1.500.000,00	56,18%	
7.000,00	2.500,00	35,71%	
9.000.000,00	5.000.000,00	55,56%	

31 PAUCAR LEMA ALEX JAVIER

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Volume of a cylinder

Radio(r)	Height(h)	π	$V=\pi * r^2 * h$	Expected Result
1	4	3.1416	$(3.1416)(1)^2(4)$	12.566
2	2	3.1416	$(3.1416)(2)^2(2)$	25.132
8	4	3.1416	$(3.1416)(8)^2(4)$	804.249
12	6	3.1416	$(3.1416)(12)^2(6)$	2714.324
4	2	3.1416	$(3.1416)(4)^2(2)$	100.531
0.5	3	3.1416	$(3.1416)(0.5)^2(3)$	2.356
1.2	9	3.1416	$(3.1416)(1.2)^2(9)$	40.715
9	5.5	3.1416	$(3.1416)(9)^2(5.5)$	1399.582
10	3	3.1416	$(3.1416)(10)^2(3)$	942.48

32 QUINGA GUAYASAMIN LEANDRO ALEXANDER

9

CALCULATE WEIGHT

Masa(m)	Gravedad(g)	$P = m \cdot g$	Expected Result	Actual Result
6 Kg	9.81 m/s	$6 \cdot 9.81$	58.86	
159 Kg	9.81 m/s	$159 \cdot 9.81$	1559.79	

-19.34 Kg	9.81 m/s	-19.34*9.81	-189.7254	
19735.335 Kg	9.81 m/s	19735.335*9.81	193603.63635	
1.889 Kg	9.81 m/s	1.889*9.81	18.53109	
-173.638 Kg	9.81 m/s	-173.638*9.81	-1703,38878	
0	9.81 m/s	0*9.81	0	
-0.17729kg	9.81 m/s	-0.17729*9.81	-1,7392149	
0.17729kg	9.81 m/s	0.17729*9.81	1.7392149	

Area of a Triangle

B	h	(B * h)/2 Expected Result	Actual result
4.56	852.22	1943.06	
40485.2	52.00	1052615.2	
523.20	526.3	137680.08	
-4502.05	2589.00	-5827903.725	
4528280.63	-98524.4	-2.2307 * 10(-11)	
545698.0	-0.25896	-70656.97704	
54365.52	20.5	557246.58	
-98505.36	-98752.55	4863827744	
-9875.00	0.2582	-1274.8625	
8582.528	28.00	120155.392	

Area of a rhombus

$$\text{Área}=(\text{Diagonal Mayor} * \text{Diagonal Menor})/2$$

$$\text{Área}=(D * d)/2$$

D	d	$(D * d)/2$	Expected Result	Actual Result
16.2	12.2	$(16.2 * 12.2)/2$	96.4	
10.07	7.93	$(10.07 * 7.93)/2$	39.92755	
6.8	4.2	$(6.8 * 4.2)/2$	14.28000	
-15.42	6.37	$(-15.42 * 6.37)/2$	-49.1127	
32.1406	9.8356	$(32.1406 * 9.8356)/2$	158.0610427	
8.2	6.2	$(8.2 * 6.2)/2$	24.4	
12.6894	-3.4598	$(12.6894 * -3.4598)/2$	-21.95139306	
17.5485	1.2458	$(17.5485 * 1.2458)/2$	10.93096065	
2.4582	0.9845	$(2.4582 * 0.9845)/2$	1.21004895	
0.1404	-24.0620	$(0.1404 * -24.0620)/2$	-1.6891524	

hypotenuse

$$c^2 = a^2 + b^2$$

a	b	Expected Result	Actual Result
6	0	6	
2,3	20	20.13	
10	9	13,45	
100.0	8.00	100,32	
5.876	126.9787	127.11	
-6.0	23	-16,16	
20.00	5	20.62	
0	0	0	
-9.0	5.2	10,39	
1	1	1,41	

36 SHUGULI REINOSO ALAN JESITH

7

Circle Perimeter

$$P=2* \pi*r$$

2	π	r	Expected Result	Actual Result
2	π	2	4π	
2	π	4	8π	
2	π	6	12π	
2	π	8	16π	
2	π	9	18π	

2	π	13	26π	
2	π	11	22π	
2	π	10	20π	
2	π	12	24π	
2	π	17	34π	

37 SIMBAÑA SIMBAÑA JONATHAN GUSTAVO 5

Circumference of the circle

$$C = \pi \cdot d$$

<u>Diametro</u>	<u>Pi</u>	<u>Expected Result</u>	<u>Actual REsult</u>
1.8	3.14	5.6	
0.5	3.14	2.3	
1.3	3.14	2.8	
0.9	3.14	2.2	

38 TAPIA ALBAN ANDREA JULIANNA 10

Area of a sphere

$$A = 4\pi r^2$$

Constant	π	r	Expected result	Actual result
4	3.1416	2.1	55.42	
		4.5	245.5	
		6.9	452.39	
		8.8	804.25	
		10.4	1256.64	
		12.6	1809.56	

		14.5	2642.09	
		16.8	3546.74	
		18.9	4488.84	
		20.2	5127.59	
		22.4	6305.32	

39 TAYO RUIZ SEBASTIAN ALEJANDRO

7

Calculus of imaginary divisions			
Numerator	Denominator	Expected Result	Actual result
(5+2i)	(4+3i)	25/26 -7/25i	
(5.5+2.3i)	(4.2i)	½ -5/4i	
4i	(0)	indeterminate	
(-3-7i)	(4)	-3/4 -7/4i	
-(4)	(2.3+5.5i)	-0.25886+0.61902i	
7+2i	-2-5i	-24/29 +31/29i	
4i+2i	2i+4i	1	

40 TECA TELLO CAMILA MILENA

10

Test Cases for Perimeter of rhomboid (float, float)

$$P = 2 \cdot (a + b)$$

Constant	Side a	Side b	Expected Result	Actual Result
2	12.3	10.9	46.4	
2	4.05	6.99	22.08	
2	7.841	6.059	27.8	
2	11.09	9.85	41.88	
2	2.0	4.7	13.4	
2	10.115	10.99	42.21	
2	5.07	4.0	18.14	
2	2.2	4.0	12.4	

2	15.7	17.09	65.58	
2	4.5	4.0	17.0	

41 TERAN FLORES MELANIE ELIZABETH

15

Elipse Area

$$A=a*b*\pi$$

Semi-minor axis (a)	Semi-major axis (b)	Expected result	Actual result
2	5	31.4159	
5	7	109.9557	
0.5	2.5	3.9269	
-2	7	Error Message	
2	4	25.1327	
0.125	1.579	0.6201	
123	215	83079.4177	
3	-8	Error Message	
12345	98765	3830399174	
-1	-3	Error Message	

42 VILLEGAS ESTRELLA SALMA ABIGAIL

10

Density Formula

$$\rho = \frac{m}{v}$$

Case Number	Mass (g)	Volume (cm3)	Expected Result	Actual Result
1	15.7	12	1.308333	
2	10.6	8.01	1.325	
3	8.3	15.2	0.53333	

4	210.6	0.96	219.375000	
5	0.36	18.3	0.019672	
6	7.89	4.29	1.839161	
7	17.5	10.13	1.75	
8	200	6.32	31.645570	
9	16	0.00007	228571.4286	
10	0.0006	7.08	0.000847	

Calculation of amperage in an electrical circuit

$$I_{(Amp)} = \frac{Volt}{R_{(Ohm)}}$$

Voltage (v)	Resistance (ohm)	V/R	Expected resulted	Amperage (A)
2	-85	2/-85	-0.0235	
5.5	547	5.5/547	0.0100	
0	186.5	0/186.5	0	
158	0	158/0	?? // Error	
0.84	15.8	0.84/15.8	0.0531	
-1.20	848	-1.20/848	-0.0014	
100.01	849.44	100.01/849.44	0.1177	
0000.9	-75	0000.9/-75	-0.0120	
85.75485	0.999	85.75485/0.999	85.8406	
0.999	5884.98	0.999/5884.98	0.00016	