## Math paper

Science, Mathematics

ASSIGN BUSTER

Derp university Derp derpington Human Resource Management Research Paper is BusinessMathematics101 1st Tri Semester SY 2011-2012 Ms. derpina derp TABLE OF CONTENTS TITLE PAGE ACKNOWLEDGEMENTii TOPICS Simple Discount1 Simple Interest2 Four types of Interest available3 Compounded Amount and Compound Interest4 Linear Programming Problems * Maximization6 * Minimization8 Forecasting by Trend Projection10 Acknowledgement I would like to thank God for guiding and giving memotivationto do this math research paper; my friends for answering my questions about this paper; Dr.

Masajo for giving me the opportunity to gain more knowledge; and my mother to constantly remind me to do better in college. I would like to thank my mentor, Ms. Grace Chong, for being my mentor and to aid me in my college life. Simple Discount Find the present value of $\$ 3800$ due in 6 months at $7 \%$ discount rate. $A) F=\$ 3800 d=7 \%=.07 t=6 / 12=1 / 2$ Formula: $D=$ Fdt Solution: $D=\$ 3800(.07)(1 / 2) D=\$ 133 P=F-D P=$ $\$ 3800-\$ 133 P=\$ 3667$ Discount $\$ 2056.80$ for 85 days at a discount rate of 6 ? \% B) $F=2056.80 d=6 ? \%=.065 t=85 / 360=17 / 72$ years Formula: D = Fdt Solution: $D=\$ 2056.80(.065)(17 / 72) D=\$ 31.57 P=F-D P=\$ 2056.80-\$ 31.57$ $P=\$ 2025.13$ Simple Interest Find simple interest on $\$ 10,000$ at the rate of 5\% for 5 years. Also find the amount for 5 years. A) $P=\$ 10,000 R=5 \%=$. $05 \mathrm{~T}=5$ years $=\mathrm{n}=5 \mathrm{I}=\mathrm{PRT} \mathrm{I}=\$ 10,000(.05)(5) \mathrm{I}=\$ 2500 \mathrm{~A}=\mathrm{P}+\mathrm{I} \mathrm{A}$ $=\$ 10,000+\$ 2500 A=\$ 12,500$ Find simple interest on $\$ 15,600$ for $1 ?$ years at the rate of $8 \%$ per annum. Also find total amount. B) $P=\$ 15,600 R$
$=8 \%=.08 \mathrm{~T}=1 ?=\mathrm{n}=1 ? \mathrm{I}=\mathrm{PRT} \mathrm{I}=\$ 15,600(.08)(1 ?) \mathrm{I}=\$ 1872 \mathrm{~A}=$ $P+I A=\$ 15,600+\$ 1872 A=\$ 174724$ Types of Interest Available

Find the different interest on \$1000 at 6\% from June 232011 to September 21 2015. A) Approximate number of days: Year: 2015-2011 = 4 Month: 8 $6=2$ Days: $51-23=284 \times 360=14402 \times 30=6028=28=1528$ Days B) Actual Number of days: 4 years $\times 365$ days $=1463$ days January 30 - June $23=173$ days January $30-$ September $21=263$ days 1463 Days -173 days $=1287$ days 1287 Days +263 days $=1550$ days $=1550$ days C) lo interest for approximate number of days: $\mathrm{Io}=\mathrm{PRT}=\$ 1000(.06)(1528 / 360) \mathrm{Io}=$ $\$ 254.67 \mathrm{D})$ le interest for approximate number of days: $\mathrm{le}=\mathrm{PRT}=\$ 1000($. 06) $(1528 / 365)$ le $=\$ 251.8 \mathrm{E})$ lo interest for actual number of days: $\mathrm{Io}=$ PRT $=\$ 1000(.06)(1550 / 360)$ lo $=\$ 258.33$ F) le Interest for actual number of days: $\mathrm{le}=\mathrm{PRT}=\$ 1000(.06)(1528 / 365) \mathrm{le}=\$ 254.79$ Compounded amount and Compounded interest Find the Compounded amount and compounded interest of $\$ 1000$ at $7 \%$ for 3 years A) B) Compounded Annually $P=\$ 1000 R=7 \%=.07 T=3$ years $=N=3 \times 1=3 A=P(1+i)^{\wedge} n A=$ $\$ 1000(1+0.7) \wedge 3 A=\$ 1225.043 \mathrm{I}=\mathrm{A}-\mathrm{PI}=\$ 1225.043-\$ 1000 \mathrm{I}=$ $\$ 225.043$ C) Compounded Semi - Annually $P=\$ 1000 R=7 / 2 \%=3.5=$. $035 \mathrm{~T}=3$ years $=\mathrm{N}=3 \times 2=6 \mathrm{~A}=\mathrm{P}(1+\mathrm{i})^{\wedge} \mathrm{nA}=\$ 1000(1+0.5)^{\wedge} 6 \mathrm{~A}=$ \$1229. $36 \mathrm{I}=\mathrm{A}-\mathrm{PI}=\$ 1229.36-\$ 1000 \mathrm{I}=\$ 229.36 \mathrm{D})$ Compounded Quarterly $\mathrm{P}=\$ 1000 \mathrm{R}=7 / 4 \%=1.75=.0175 \mathrm{~T}=3$ years $=\mathrm{N}=3 \times 4=$ $12 \mathrm{~A}=\mathrm{P}(1+\mathrm{i})^{\wedge} \mathrm{nA}=\$ 1000(1+0.175)^{\wedge} 12 \mathrm{~A}=\$ 1231.44 \mathrm{I}=\mathrm{A}-\mathrm{PI}=$ \$1231. $44-\$ 1000 \mathrm{I}=\$ 231.44 \mathrm{E})$ Compounded Monthly $\mathrm{P}=\$ 1000 \mathrm{R}=7$ / $12 \%=.5833=.00583 \mathrm{~T}=3$ years $=N=3 \times 12=36 \mathrm{~A}=\mathrm{P}(1+\mathrm{i})^{\wedge} \mathrm{n} \mathrm{A}=$ $\$ 1000(1+.00583)^{\wedge} 36 \mathrm{~A}=\$ 1232.78 \mathrm{I}=\mathrm{A}-\mathrm{P} \mathrm{I}=\$ 1232.78-\$ 1000 \mathrm{I}=$
\$232. 78 Compounded amount and Compounded interest Find the
Compounded amount and compounded interest of $\$ 1500$ at $5 \%$ for 3 years
A) B) Compounded Annually
$P=\$ 1500 R=5 \%=.05 T=3$ years $=N=3 \times 1=3 A=P(1+i)^{\wedge} n A=$ $\$ 1500(1+.05)^{\wedge} 3 A=\$ 1736.4375 \mathrm{I}=\mathrm{A}-\mathrm{PI}=\$ 1736.4375-\$ 1500 \mathrm{I}=$ $\$ 236.4375$ C) Compounded Semi - Annually $P=\$ 1500 R=5 / 2 \%=2.5$ $=.025 \mathrm{~T}=3$ years $=\mathrm{N}=3 \times 2=6 \mathrm{~A}=\mathrm{P}(1+\mathrm{i})^{\wedge} \mathrm{nA}=\$ 1500(1+.025)^{\wedge}$ $6 A=\$ 1739.540127 I=A-P I=\$ 1739.540127-\$ 1500 I=\$ 739.540127$
D) Compounded Quarterly $\mathrm{P}=\$ 1500 \mathrm{R}=5 / 4 \%=1.25=.0125 \mathrm{~T}=3$ years $=N=3 \times 4=12 A=P(1+i)^{\wedge} n A=\$ 1500(1+.0125)^{\wedge} 12 A=$ \$1741. $131777 \mathrm{I}=\mathrm{A}-\mathrm{P} \mathrm{I}=\$ 1741.131777-\$ 1500 \mathrm{I}=\$ 741.131777 \mathrm{E})$ Compounded Monthly $\mathrm{P}=\$ 1500$
$R=5 / 12 \%=.41666=.00416 T=3$ years $=N=3 \times 12=36 A=P(1+i)$ $\wedge \mathrm{n} \mathrm{A}=\$ 1500(1+.00416) \wedge 36 \mathrm{~A}=\$ 1741.792 \mathrm{I}=\mathrm{A}-\mathrm{PI}=\$ 1741.792$ \$1500 I = \$741. 792 Linear Programming Problems (Maximization) Levi's Jeans manufacturing company purchase 2 styles of jeans, style $X$ and style $Y$, which sell for $\$ 90$ and $\$ 75$ appropriately. Unit production test for style $X$ is $\$ 40$ and for style $Y \$ 35$. Raw materials available monthly are 90 meters while processing time at a max of 70 hours per week. Style $X$ jeans made 3 meters of materials and 2 for processing them. For style $Y, 2$ meters and 2 for processing.

Style X market demand is no more than 40 per week. How many of each style should be produced in each week in order to make profit maximum? | Style X| Style Y| Total Available| RM| 3| 2| 90| PT| 2| 2| 70| MD| 40| ||| Style

X| Style Y| USP| \$90| \$75| UPE| 40| 35| UBM| \$50| \$40| Composition of linear programming problems: I. Decision Variable $X=$ Number of style $X$ to be produced weekly $\mathrm{Y}=$ Number of style Y to be produced weekly II. Objective Function Maximum Profit ( $Z$ ): $Z=\$ 50 X+\$ 40 Y$ III. Subjects \& Constraints: RM $=3 X+2 Y<90 P T=2 X+2 Y<70 \mathrm{MD}=\mathrm{X}<40 \mathrm{X} ; \mathrm{Y}>0 \mathrm{IV}$. Graphical Solutions
A) By intercept B) Graphical presentations and points A intersection between 2 lines C) Testing the curve of the convex polygon formed form the objective function V. Decision Raw Materials: $3 X+2 Y<90 X=30 Y=45$ Processing Time: $2 X+2 Y<70 X=35 Y=35$ Market Demand: $X=40 A$ ) $Z=\$ 50 X+$ $\$ 40 Y=\$ 50(0)+\$ 40(35)=\$ 1400 B) Z=\$ 50 X+\$ 40 Y=\$ 50(20)+\$ 40(75)$ $=\$ 1600 \mathrm{C}) \mathrm{Z}=\$ 50 \mathrm{X}+\$ 40 Y=\$ 50(30)+\$ 40(0)=\$ 1500$ Choose B .

Decision: The Levi's manufacturing company must produce 20 pieces of style $X$ and 50 pieces of style $Y$ to have a maximum profit of $\$ 1600$. Linear Programming Problems (Minimization)

Mrs. Smith mining company owns two mines grading ores graded into 3 classes. High grade (H), Medium grade (M) and low grade (L). The company is tied with a contract to provide a smelting plant with 12 tons of $(\mathrm{H}), 8$ tons of (M), and 24 tons of (L) per week. It costs $\$ 2000$ per day to run mine 1 and $\$ 1600$ per day to run mine 2. In a day operation, Mine 1 produces 6 tons of $(H), 2$ tons of $(M)$ and 4 tons of (L). While mine 2 produces 2 tons of $(H) ; 2$ tons of (M) and 12 tons of (L). How many days a week should each mines operation to fulfil company's commitment most economically? | Mine 1| Mine 2| Total Available|

H| 6| 2| 12| M| 2| 2| 8| 니 4| 12| 24| Cost| $\$ 2000|\$ 1600|$ | I. Decision Variables: $\mathrm{X}=$ Number of days to run mine $1 \mathrm{Y}=$ Number of days to run mine 2 II. Objective Functions: Minimum Cost $=\$ 2000 \mathrm{X}+\$ 1600 \mathrm{Y}$ III. Subjects to Constraints: $\mathrm{H}=6 \mathrm{X}+2 \mathrm{Y}>12 \mathrm{M}=2 \mathrm{X}+2 \mathrm{Y}>8 \mathrm{~L}=4 \mathrm{X}+12 \mathrm{Y}>$ $24 \mathrm{X} ; \mathrm{Y}<0 \mathrm{IV}$. Graphical Solutions $\mathrm{H}=6 \mathrm{X}+2 \mathrm{Y}>12 \mathrm{M}=2 \mathrm{X}+2 \mathrm{Y}>8 \mathrm{~L}=4 \mathrm{X}$ $+12 Y>24 X=2 Y=6 X=4 Y=4 X=6 Y=2 P 1(0,6) \operatorname{Min} C=\$ 2000(0)+$ $\$ 1600(6)=\$ 9600 \mathrm{P} 2(1,3) \mathrm{Min} \mathrm{C}=\$ 2000(1)+\$ 1600(3)=\$ 6800 \mathrm{P} 3(3,1)$ Min C $=\$ 2000(3)+\$ 1600(1)=\$ 7600$ P4 (6, 0) Min C $=\$ 2000(6)+$ $\$ 1600(0)=\$ 12000$

Choose P2 V. Decision: Mrs. Smith's mining company should run mine 1 for 1 day and Mine 2 for 3 days in order to have a minimum cost of $\$ 6800$.

Forecasting by Trend Projection Forecast and graph the production of rice in the Philippines for the years 2012 and 2015 of the annual production of rice from year 2000 to year 2010. Year (N)| Production of Rice (Y)| X| XY| Y'| $\mathrm{X}^{\wedge} 2 \mid$ 2000| 20 | 이 이 | $0 \mid 2001$ | $22|1| 22||1| 2002| 18|2| 36||4| 2003| 19|3| 57|\mid$ 9| 2004| 21 | 4 | $84||16| 2005| 24|5| 120||25| 2006| 22|6| 132||36| 2007|$ 26| 7| 182|| 49| 2008| 28| 8| 224|| 64| 2009| 25| 9| 225|| 81| 010| 30| 10| 300|| 100|| $?(\mathrm{Y})=255|?(\mathrm{X})=55| ?(\mathrm{XY})=1382| | ?\left(\mathrm{X}^{\wedge} 2\right)=385 \mid 2$ Normal Equations: ? $(\mathrm{Y})=\mathrm{NA}+\mathrm{B}$ ? $(\mathrm{X})$ Equation 1 ? $(\mathrm{XY})=\mathrm{A}$ ? $(\mathrm{X})+\mathrm{B}$ ? $\left(\mathrm{X}^{\wedge} 2\right)$ Equation 2 Solve for B) $255=11 \mathrm{~A}+55 \mathrm{~B}(-5) 1382=55 \mathrm{~A}+385 \mathrm{~B}-1275=-55 \mathrm{~A}-$ $275 \mathrm{~B} 1382=55 \mathrm{~A}+385 \mathrm{~B} 107 / 100=110 \mathrm{~B} / 100 \mathrm{~B}=.97272727$ Solve for A$)$ $255=11 \mathrm{~A}+55 \mathrm{~B} 11 \mathrm{~A}+55 \mathrm{~B}=25511 \mathrm{~A}+55(.97272727)=25511 \mathrm{~A}+53.5$ $=25511 \mathrm{~A}=255-53.511 \mathrm{~A} / 11=201.5 / 11 \mathrm{~A}=18.31818182 \mathrm{~A}=18.32$ $B=0.97$ Formula $Y^{\prime}=A+B x$ Year $2000=18.32+0.97(0) Y^{\prime}=18.32$ Year $2001=18.32+0.97(1) Y^{\prime}=19.29$ Year $2002=18.32+0.92(2) Y^{\prime}=20$.

6 Year $2003=21.23$ Year $2004=22.2$ Year $2005=23.17$ Year $2006=24$. 14 Year $2007=25.11$ Year $2008=26.08$ Year $2009=27.05$ Year $2010=$ 28. 02 In the table: Year (N)| Production of Rice (Y)| X| XY| Y'| $\mathrm{X}^{\wedge} 2|2000| 20 \mid$ 이 0| 18. 32| $0|2001| 22|1| 22|19.29| 1|2002| 18|2| 36|20.26| 4|2003|$ 19|3| $57|21.23| 9|2004| 21|4| 84|22.2| 16|2005| 24|5| 120|23.17| 25 \mid$ $2006|22| 6|132| 24.14|36| 2007|26| 7|182| 25.11|49| 2008|28| 8|224|$ 26. 08 | $64|2009| 25|9| 225|27.05| 31|2010| 30|10| 300|28.02| 100|\mid ?$ $(Y)=255|?(X)=55| ?(X Y)=1382| | ?\left(X^{\wedge} 2\right)=385 \mid$

