Solutions To Project 1

(1a)

$$-150+80+130-40-90$$
$$-70+130-40-90$$
$$60-40-90$$
$$20-90$$
$$-70$$

A loss of \$70.

(1b)

$+500-800=-300$

He is short 300 shares.

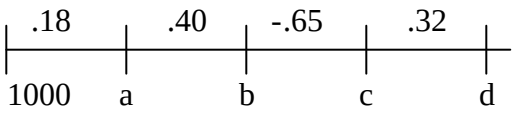
(1c)

$$-9\times 2-(-7)+4$$
$$-18+7+4$$
$$-11+4$$
$$-7$$

(1d)

$20-10^2$
$20-100$
-80

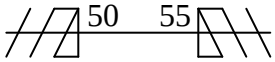
(1e)



$a \rightarrow 1000+1000\times .18=1000+180=1180$
$b \rightarrow 1180+1180\times .40=1180+472=1652$
$c \rightarrow 1652+1652\times(-.65)=1652-1074=578$
$d \rightarrow 578+578\times .32=578+185=763$
The value is \$763

(2a)

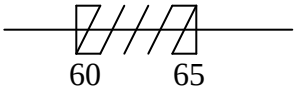
Let $x=$ price of GM
$x\le 50$ or $55\le x$



(2b)

Let $x =$ price of MCD

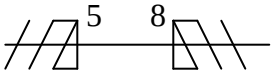
$60 \le x \le 65$



(2c)

$8 < x < 5$ no x satisfies!

writer may mean $x < 5$ or $8 < x$



$8 < x < 5$ mean $8 < x$ and $x < 5$

(2d)

$a \le a^2$ is valid except for $0 < a < 1$

Note: $a = \frac{1}{4} \Rightarrow a^2 = \frac{1}{16}$

(2e)

$a \le b \Rightarrow ac \le bc$
is valid if and only if $0 \le c$
if $c < 0$ then $bc \le ac$

Note: $4 \le 10$ yet
$-8 = 4(-2) \ge 10(-2) = -20$

(3a)

$$\frac{3\frac{2}{3} - 4\frac{1}{8}}{2\frac{1}{6}} = \frac{\frac{11}{3} - \frac{33}{8}}{\frac{13}{6}}$$

$$= \frac{88 - 99}{24} \times \frac{6}{13}$$

$$= \frac{-11}{24} \times \frac{6}{13}$$

$$= \frac{-11}{4} \times \frac{1}{13}$$

$$= \frac{-11}{52}$$

(3b)

$$1\frac{1}{2}+2\frac{1}{3}-4\frac{3}{4}$$

$$1\frac{6}{12}+2\frac{4}{12}-4\frac{9}{12}$$

$$\frac{18}{12}+\frac{28}{12}-\frac{57}{12}$$

$$\frac{18+28-57}{12}=\frac{-11}{12}$$

(3c)

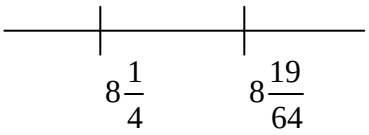
$$\frac{165}{99}=\frac{3\times 55}{3\times 33}=\frac{5\times 11}{3\times 11}=\frac{5}{3}$$

(3d)

$$8\frac{19}{64} \quad 8\frac{1}{4}$$

$$8\frac{19}{64} \quad 8\frac{16}{64}$$

Bad Market for Linda is bidding higher than she is offering!



(3e)

Bad Rule!

Counter example:

$$1=\frac{1}{2}+\frac{1}{2}\neq\frac{1+1}{2+2}=\frac{2}{4}$$

(4a)

$$7\times\left(5000\times\left(-3\frac{1}{4}\right)\right)$$

$$-35000\times 3.25$$

$$-113750$$

A loss of $ 1137.50

(4b)

$-4\times(100\times(-10))$

$+4000$

A profit of \$40

(5a)

1,200,000

1.2×10^{6}

(5b)

.0034

3.4×10^{-3}

(5c)

2.73×10^{-2}

.0273

(5d)

3.61×10^{4}

36,100

(5e)

$3\frac{1}{2}$ billion

3,500,000,000

3.5×10^{9}

(6a)

$$\left(\frac{2x}{y^2}\right)^4=\frac{2^4x^4}{\left(y^2\right)^4}=\frac{16x^4}{y^8}$$

(6b)

$5a^{-3}b\left(a^2+a^4b^{-3}\right)$

$=5a^{-1}b+5a^1b^{-2}$

$=\frac{5b}{a}+\frac{5a}{b^2}$

(6c)

$$\frac{a^{-3}b}{3^{-1}a^{2}} = \frac{3b}{a^{5}}$$

(6d)

$$\left(4uv^{-2}w\right)^{-3} = \frac{1}{4^{3}} \times \frac{1}{u^{3}} \times v^{6} \times \frac{1}{w^{3}} = \frac{v^{6}}{64u^{3}w}$$

(6e)

$$\left(-\frac{2}{3}x^{-1}y\right)\left(\frac{3}{5}x^{7}z^{-1}\right)$$

$$-\frac{2}{5}x^{6}yz^{-1}$$

$$-\frac{2x^{6}y}{5z}$$

(7a)

$$-2x(5-3y)-(-7x)+yx$$

$$-10x+6xy+7x+xy$$

$$-3x+7xy$$

(7b)

$$\frac{2x}{3}-\frac{1}{2}(x-5)+\frac{7(x-1)}{4}$$

$$\frac{2}{3}x-\frac{1}{2}x+\frac{5}{2}+\frac{7}{4}x-\frac{7}{4}$$

$$\frac{8}{12}x-\frac{6}{12}x+\frac{21}{2}x+\frac{10}{4}-\frac{7}{4}$$

$$\frac{23}{12}x+\frac{3}{4}$$

(7c)

$$(8u+5)(2u-3)$$

F O I L

$$16u^{2}-24u+10u-15$$

$$16u^{2}-14u-15$$

(7d)

$$(2x-5)(3x^2+x-7)$$
$$2x(3x^2+x-7)$$
$$-5(3x^2+x-7)$$
$$6x^3+2x^2-14x$$
$$-15x^2-5x+35$$
$$6x^3-13x^2-19x+35$$

(7e)

$$\frac{10}{10}\left(\frac{.4(x-1)+.3(2-x)}{.7}\right)$$
$$\frac{4(x-1)+3(2-x)}{7}$$
$$\frac{4x-4+6-3x}{7}=\frac{x+2}{7}$$

(8a)

$$\frac{30x^3-15x}{5x}$$
$$\frac{15x(2x^2-1)}{5x}$$
$$3(2x^2-1)$$

(8b)

$$\frac{5}{x^2}-\frac{10}{xy}$$
$$\frac{5}{x}\left[\frac{1}{x}-\frac{2}{y}\right]$$

(8c)

$$\frac{8x^2y+32xy^4}{xy}$$
$$\frac{8xy(x+4y^3)}{xy}$$
$$8(x+4y^3)$$

(8d)

$$\frac{az^3 - az + 1}{a}$$

Not Factorable
Note: can say

$$\frac{a\left(z^3 - z + \frac{1}{a}\right)}{a}$$

$$z^3 - z + \frac{1}{a}$$

(8e)

$$\frac{ab + c}{a} \Rightarrow b + c$$

Invalid Rule!
a is not a factor of entire numerator!

Note: $\frac{2 \times 3 + 4}{2} = 5$

not 7

(9a)

$$\left(\frac{3}{4}\right)^{-2} = \frac{3^{-2}}{4^{-2}} = \frac{16}{9} = 1.78$$

(9b)

$$X < 0$$

(9c)

$$(3.45)^6 = 1686.22$$

$$(3.45)^{60} = 1.86 \times 10^{30}$$

(a large number)

(9d)

Invalid

$$-2(4x - 7)^3 \neq (-8x + 14)^3$$

$$A.B^3 \neq (A.B)^3 = A^3 B^3$$

(9e)

$$(A \pm B)^2 = A^2 \pm 2AB + B^2$$
$$(A \pm B)^3 = A^3 \pm 3A^2B + 3AB^2 \pm B^3$$

(9f)

Valid for all a!

(9g)

$$5\,5/6 \times (-2\,3/5)$$
$$-\frac{35}{6} \times \frac{13}{5} = -\frac{7 \times 13}{6} = -\frac{91}{6} = -15.167$$

(9h)

$$100 \xrightarrow{-.10} 90 \xrightarrow{-.25} 67.5$$

A reduction of $32.5 or 32.5%

$$1 - ((1 - R_1)(1 - R_2))$$
$$R_1 + R_2 - R_1R_2$$

(10a)

$$W = 5X - 10C$$

(10b)

$$W = -8X + 6C - 9P$$

(10c)

$$W = 80X$$

(10d)

$$W = -40C - 40P$$

(10e)

$$W = 120X + 150P$$