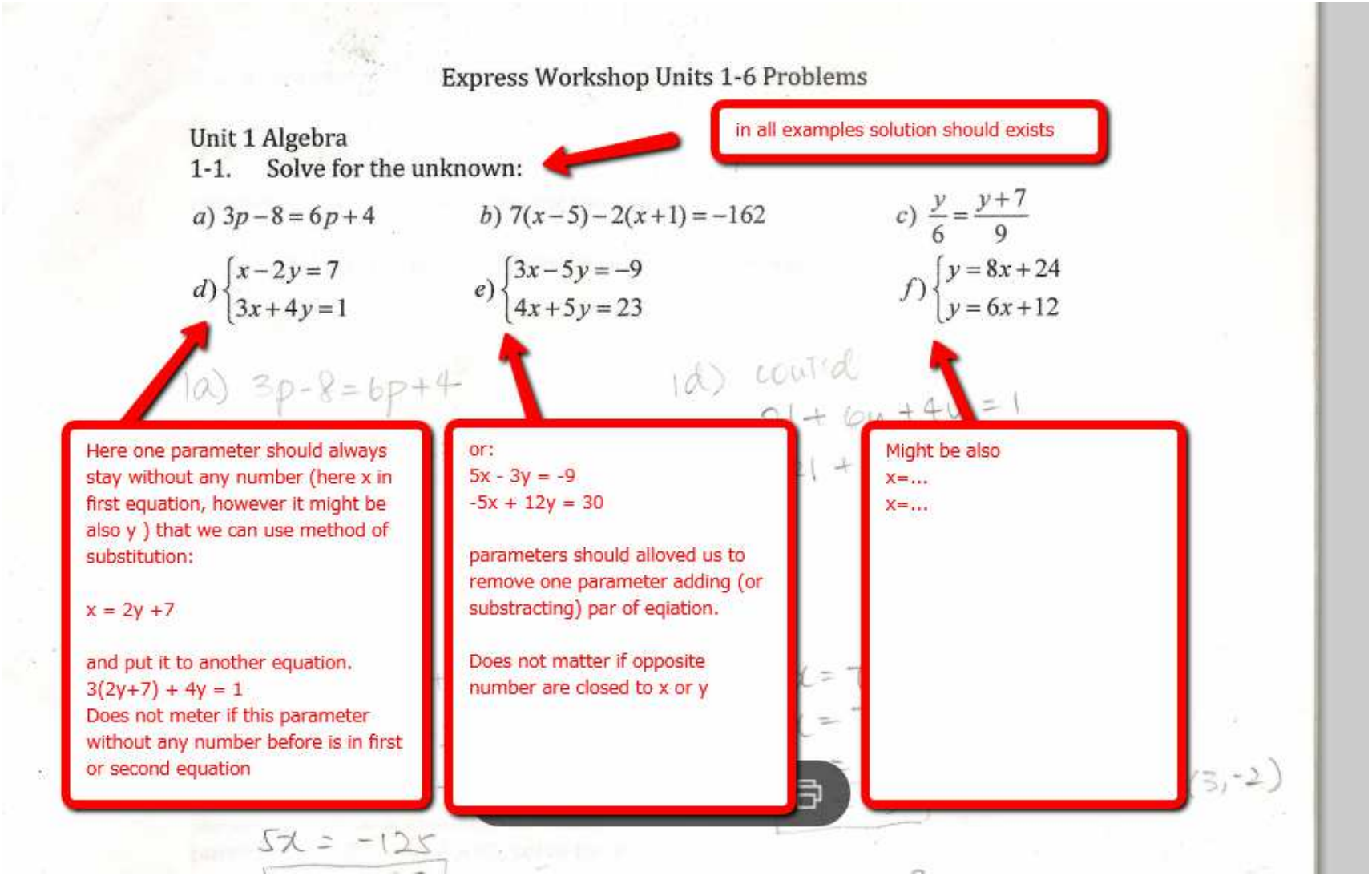
TRSM PRACTISE MODULE

1. ALGEBRA :

1.1.



1.2.

1-2. A company pays its employees according to the formula:

$P = \frac{500n + 360}{n}$, where P is the weekly salary in dollars (per person) and n is the number of employees working for the company.

a) Find the weekly pay when there are 30 employees

Letters and numbers and context in the task should be changed as variations

$P = \frac{500(30) + 360}{30}$

$P = 512$

b) Find the number of employees if the weekly salary is $545

$P = 545$

$n = ?$

$545 = \frac{500n + 360}{n}$

$545n = 500n + 360$

$45n = 360$

$n = 8$

$4\sqrt{n}$

1.3.

1-3. The formula for the revenue of a certain business is given as $R = \frac{A\sqrt{n}}{2}$ where

R represents the revenue in millions of dollars in year number n and A represents the amount of cash available in millions of dollars when the company was originally purchased. If R=28 and A=8, solve for n.

$R=28$
$A=8$
$n=?$

$28 = \frac{8\sqrt{n}}{2}$

$28 = 4\sqrt{n}$

$7 = \sqrt{n}$

$7^2 = n$

$\therefore \boxed{n = 49}$

Letters, numbers and context should be changed as variations

1.4

1-4 Four chocolate bars and three ice-cream cones cost $5.30. Two chocolate bars and one ice-cream cost $2.20. Find the cost of a chocolate bar and the cost of an ice-cream cone.

letters, numbers and context should be changed as a variations

Let x represent cost per chocolate bars

Let y " " " ice cream cone.

$3y = 5.30$ --- ①

$y = 2.20$ --- ② ×2

$3y = 5.30$

$-\ 4x + 2y = 4.40$

$y = 0.9$

$2x + 0.9 = 2.20$

$2x = 1.3$

$x = 0.65$

$\therefore (x, y) = (0.65, 0.9)$

$0.65 per chocolate bar

$0.90 per ice cream cone

1.5.

1-5 There are 41 bank managers and tellers combined in a branch. Assuming that each manager makes $6000 per month and each teller makes $3800 per month and the total paid out monthly is $173400, how many managers are there?

	# of people	Salary	Total Salary
Bank managers	x	6000	$6000x$
Tellers	y	3800	$3800y$
Total	41		173400

letters, numbers and context should be changed as variations

$x + y = 41$ --- ①

$6000x + 3800y = 173400$ --- ②

$6000x + 6000y = 246000$

$-(6000x + 3800y = 173400)$

$2200y = 72600$

$y = 33$.

$\therefore x = 41 - y$

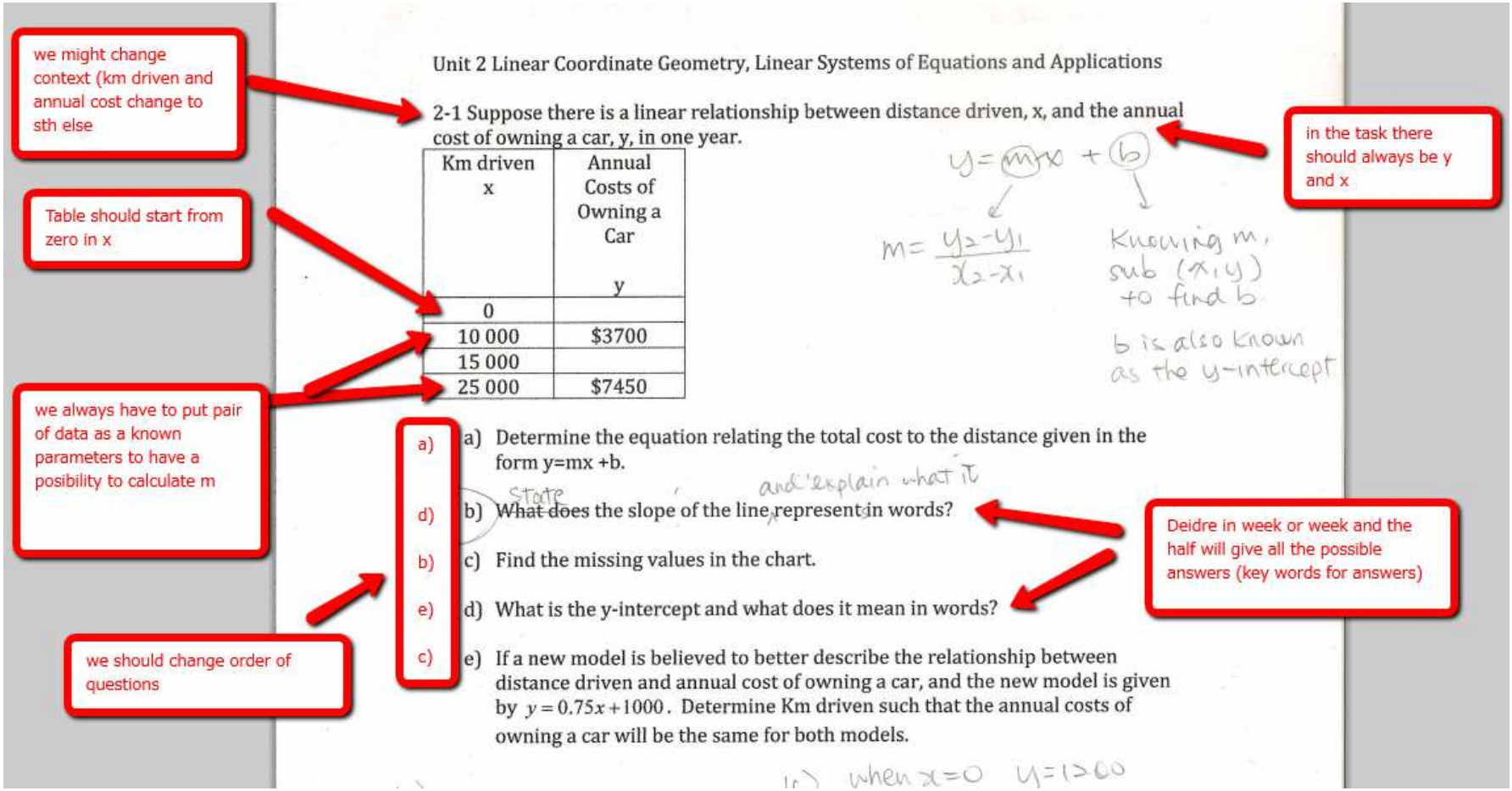
$x = 41 - 33$

$\boxed{x = 8}$

$\therefore$ 8 bank managers

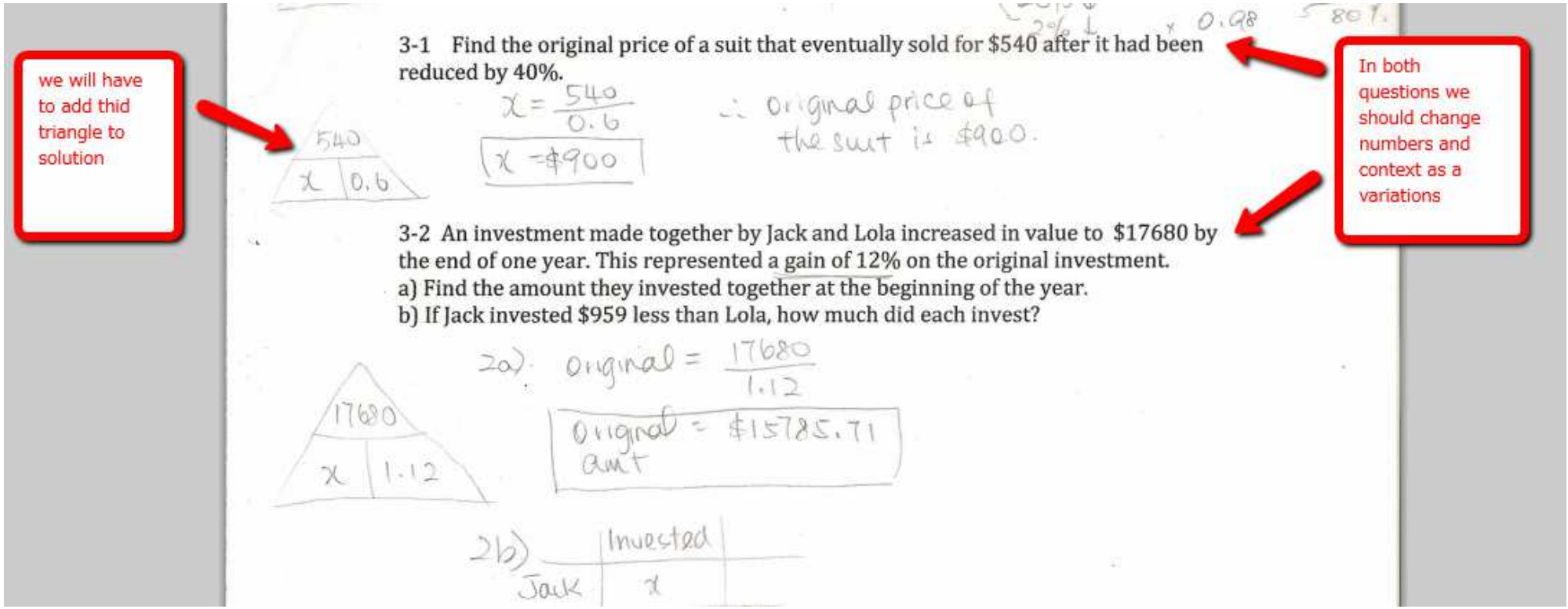
2. EQUATION OF LINES

2.1



3. PERCENT

3.1 & 3.2



3.3

3-3

Year	2001	2002	2003	2004
Number of Students in Management		7460	8200	

context and numbers should be changed as a variations

The chart above represents the number of students at Ryerson University in Management.

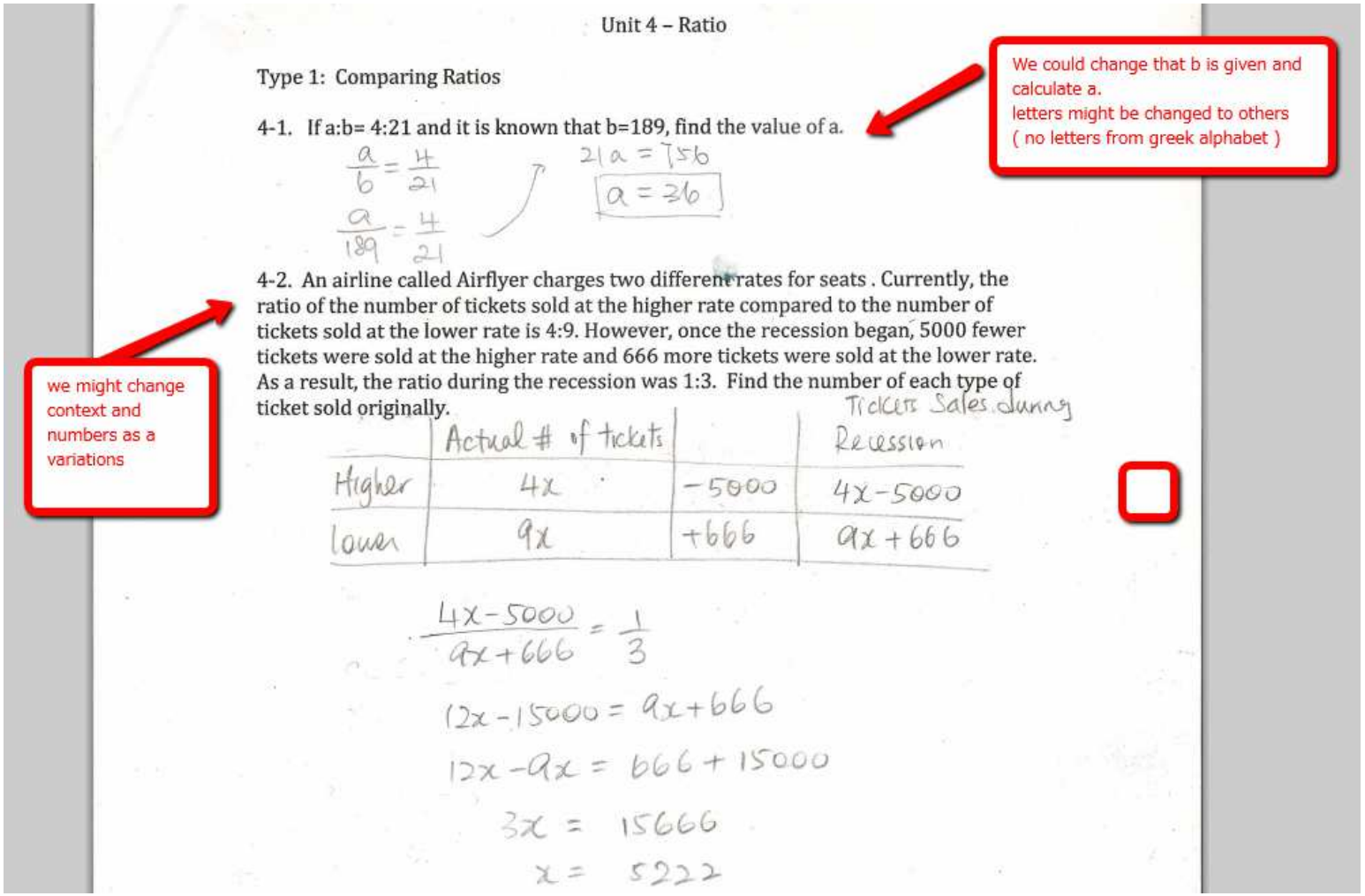
a) Find the percentage increase from 2002 to 2003, rounded to two decimal places.

b) If the number of students increased by 10% from 2003 to 2004, find the number of people in management in 2004.

c) If the number of students in 2002 is 105% of the number of students in 2001, find the number of students in 2001. Round to the nearest student.

4. RATIO

4.1 & 4.2



Unit 4 – Ratio

Type 1: Comparing Ratios

4-1. If a:b= 4:21 and it is known that b=189, find the value of a.

$\frac{a}{b} = \frac{4}{21}$

$\frac{a}{189} = \frac{4}{21}$

$21a = 756$

$a = 36$

We could change that b is given and calculate a.
letters might be changed to others
(no letters from greek alphabet)

4-2. An airline called Airflyer charges two different rates for seats . Currently, the ratio of the number of tickets sold at the higher rate compared to the number of tickets sold at the lower rate is 4:9. However, once the recession began, 5000 fewer tickets were sold at the higher rate and 666 more tickets were sold at the lower rate. As a result, the ratio during the recession was 1:3. Find the number of each type of ticket sold originally.

we might change context and numbers as a variations

Tickets Sales during Recession

	Actual # of tickets		
Higher	$4x$	-5000	$4x-5000$
lower	$9x$	$+666$	$9x+666$

$\frac{4x-5000}{9x+666} = \frac{1}{3}$

$12x - 15000 = 9x + 666$

$12x - 9x = 666 + 15000$

$3x = 15666$

$x = 5222$

4.3 & 4.4

Type 2: Given Total or Difference

4-3. The ratio of hybrid cars to regular cars in a particular car dealership is 4:7. If there is a total of 143 cars, determine the number of each type of cars in the dealership.

context and numbers might be changed

	Actual # of cars
hybrid	$4x$
regular	$7x$
Total	143

$\therefore 4x + 7x = 143$

$11x = 143$

$x = 13$

$\therefore$ hybrid $= 4(13) = 52$

regular $= 7(13) = 91$

4-4. A method for determining the value of a company is the ratio of the company's assets to its debts. In a company called Jacksmart, the assets to debts ratio was 18:5. It is also known that the difference between the company's assets and its debts was $16328. Find the value of the debts of Jacksmart.

	Actual #
Assets	$18x$
Debts	$5x$
Difference	16328

4.5

More complicated type 2 question.

4-5. In a certain hotel, the ratio of those paid at the higher rate to those paid at the lower rate is 3:11. If people are paid $25 at the higher rate and $12 at the lower rate and the total amount paid out each hour to all employees is $3 105, determine the total number of employees in the company.

	# of people	Salary/person	Total Salary
Higher	$3x$	$\$25$	$25(3x) = 75x$
Lower	$11x$	$\$12$	$12(11x) = 132x$
Total			$\$3105$

context and numbers might be changed as a variation

$75x + 132x = 3105$

$207x = 3105$

$x = 15$

People paid at a higher rate $= 3(15) = 45$

" " " lower rate $= 11(15) = 165$

Total number of employees $= 210$

5. FINANCIAL MATH

5.1

$A = P(1+rt)$

$A = P(1+\frac{r}{4})^{4n}$ etc

Unit 5-Financial Math

5-1. A sum of $1 500 is invested in a bank account where interest is calculated at 8% per annum.

a. If this sum is invested for 10 years, what amount will it come to at the end of this ten year period if interest is calculated as:
   i. Simple interest ii. Compound interest? iii. Compounded quarterly

b. What length of time will it take for this sum to amount to $4 500 if interest is calculated as compound interest? Round to two decimal places.

Context and letters should be changed as a variation

(i) $A = P(1+rt)$
$= 1500[1+0.08(10)]$
$= \$2700$

(ii) $A = 1500(1+.08)^{10}$
$= \$3238.39$

iii) $A = 1500(1+\frac{.08}{4})^{10(4)}$
$= \$3312.06$

b) $A = 4500$
$P = 1500$
$r = 0.08$

$4500 = 1500(1+.08)^n$
$3 = 1.08^n$

5.2

5-2. An investment of $50 000 was made 7 years ago at a fixed annual rate of interest on a bond. Its maturity value was $70 356. Find the fixed rate of annual compound interest on the bond.

70356
50000
7
r

$70356 = 50000(1+r)^7$

$1.40712 = (1+r)^7$

$1.40712^{(\frac{1}{7})} = 1+r$

$1.050002087 = 1+r$

$r = 0.050002087$

$\therefore r = 5\%$

5.3

5-3. How much do I need to invest today, at 6% per year, compounded daily in a savings account in order to have $40 000 at the end of 18 years for my child's tuition for his university education?

$A = 40000$

$P = ?$

$r = .06$

$n = 18$

$40000 = P\left(1+\frac{.06}{365}\right)^{365(18)}$ (6570)

$40000 = 2.9444182P$

$P = \$13585.03$

5.4

5-4. An asset is known to appreciate in value by 15% (simple interest) per year. It was purchased on Mar 1, 2009. If it was worth $25 000 at the end of 2009, how much was it worth when it was purchased? (note: there are 306 days from Mar 1 to Dec 31.)

$A = 25000$

$P = ?$

$r = 0.15$

$t = \frac{306}{365}$

$A = P(1+rt)$

$25000 = P\left[1 + 0.15\left(\frac{306}{365}\right)\right]$

$25000 = 1.125753425\,P$

$P = \$22207.35$

6. PROBABILITY

6.1

$P(A) = \frac{n(A)}{n(S)}$ = what the question want / total possibility

Unit 6 Probability

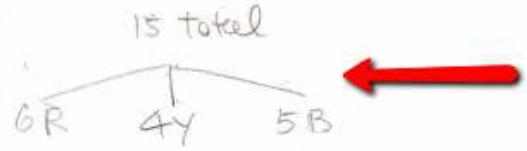
context and nuumbers should be changed as variations

6-1. A row of inflated balloons sit in a row along a wall. Six are red, four are yellow and five are blue. A person is blind-folded and throws darts at the balloons.

a) If only one ball is hit, determine the probability that the dart hits a yellow ball.

b) If two balls are pierced consecutively, determine the probability that both balloons pierced are red.

c) If two balls are pierced by darts, determine the probability that the pierced balloons are of different colours. and the second balloon is yellow.



this schema should be in solution

(a) $P(\text{yellow}) = \frac{4}{15}$

b) $P(R \& R) = \left(\frac{6}{15}\right)\left(\frac{5}{14}\right)$

$= 0.14$

c) $P(R\&Y \text{ or } B\&Y) = \left(\frac{6}{15}\right)\left(\frac{4}{14}\right) + \left(\frac{5}{15}\right)\left(\frac{4}{14}\right)$

$= \frac{24}{210} + \frac{20}{210}$

$= 0.21$

6.2 - variation is a change of context !

6-2. 25% of all TRSM students spend 2 hours or more per day on FACEBOOK. 60% of all students who spend 2 hours per day or more on FACEBOOK have GPA's below 3.0. At TSRM, 40% of all students have GPA's below 3.0.

a) Use the information shown above to complete the chart below:

All in %	<2h Facebook	≥2h Facebook	Total
GPA <3.0	0.25	.6(.25)=0.15	0.4
GPA ≥ 3.0	0.5	0.1	0.6
Total	0.75	0.25	1

b) Determine the probability that a student achieves a GPA of 3.0 or higher, given that they use FACEBOOK for 2 hours or more per day.

c) Determine the probability that a student is on FACEBOOK less than 2 h given that they have a GPA of 3.0 or more.

b) $P(GPA \geq 3 \mid FB \geq 2) = \frac{0.1}{0.25}$

$= 0.4$

c) $P(FB < 2 \mid GPA \geq 3) = \frac{0.5}{0.6}$

$= \boxed{0.8\overline{3}}$