

Handout 02.18: Return Math

Name: _____ Date: _____ Partner (Part C): _____

The formula

Percent return = (ending value minus starting value) divided by starting value, times 100.

As a picture: a fraction with “ending minus starting” on top and “starting” on the bottom, then “times 100” beside it. (The slide shows it drawn large with **STARTING** in bold.)

The bottom of the fraction is always the **starting** value. If you divide by the ending value, you get the wrong answer every time.

A loss gets a minus sign. A gain gets a plus sign.

Worked example. A merchant started with AQ25,000 and has AQ23,000 now.

- Ending minus starting: 23,000 minus 25,000 = minus 2,000
- Divided by starting: minus 2,000 divided by 25,000 = minus 0.08
- Times 100: minus 8 percent

The merchant’s return is minus 8 percent.

Part A: Practice (alone)

Show the subtraction line and the division line for each one.

#	Starting value	Ending value	Ending minus starting	Divided by starting	Percent return
1	AQ25,000 (a portfolio)	AQ27,500			_____ percent
2	AQ25,000 (a portfolio)	AQ22,000			_____ percent
3	AQ100.00 (one unit of Iron Vault)	AQ85.00			_____ percent
4	AQ48.50 (one unit of Sparkstone on Day 1)	AQ57.80 (Day 5)			_____ percent

Grade 6 support rows (round numbers):

#	Starting value	Ending value	Ending minus starting	Divided by starting	Percent return
5	AQ100	AQ120			____ percent
6	AQ100	AQ75			____ percent

7. The trick question. Sparkstone was AQ57.80 at the peak and AQ31.20 at the bottom of the crisis.
- The drop, as a percent of the peak: (31.20 minus 57.80) divided by 57.80, times 100 = ____ percent
 - The climb back, as a percent of the bottom: (57.80 minus 31.20) divided by 31.20, times 100 = ____ percent
 - Why are the two percents different when the AQ change (26.60) is the same both ways?

Part B: My own return (alone, from your own screen or ledger)

My starting value: AQ 25,000

My total fortune right now: AQ _____

Ending minus starting: _____

Divided by starting: _____

Times 100: my percent return so far is _____ percent (circle: gain / loss)

Check it on the calculator: _____ Same? yes / no

The venture that hurt me most across the crisis. From your ledger or the price history: the price on Day 5 (before the crisis) and the price on Day 7 (the bottom).

Ticker: _____ Day 5 price: AQ _____ Day 7 price: AQ _____

(Day 7 minus Day 5) divided by Day 5, times 100 = _____ percent

Part C: A safe portfolio and a risky portfolio over the same eight days (pairs)

Three merchants bought on Day 1 and never traded again. The values below are their total fortune on three days: the peak (Day 5, right before the crisis), the bottom (Day 7), and today (Day 8, recovery). These are example prices; your class's live prices will differ.

- **Safe:** all AQ25,000 in the Honeypot Coffers (250 units at AQ100.00).
- **Risky:** 500 units of Sparkstone Mines at AQ48.50 (AQ24,250) plus AQ750 cash.
- **Mixed:** 100 SPRK, 100 CLDB, 50 IRON, 50 SEAL, 50 WLLW, 30 HNYP, 15 MDOW (AQ24,880) plus AQ120 cash.

Portfolio	Value at the peak (Day 5)	Return at the peak	Value at the bottom (Day 7)	Return at the bottom	Value today (Day 8)	Return today
Safe	AQ25,050.00	_____ percent	AQ25,075.00	_____ percent	AQ25,087.50	_____ percent
Risky	AQ29,650.00	_____ percent	AQ16,350.00	_____ percent	AQ19,200.00	_____ percent
Mixed	AQ26,894.00	_____ percent	AQ21,834.00	_____ percent	AQ22,962.00	_____ percent

Round to one decimal place.

8. At the peak, which portfolio looked smartest? At the bottom? Today?



9. Which portfolio would you rather have held for these eight days, and better for what (money for college in ten years, or rent next month)? Circle one and give a number.

Safe / Risky / Mixed. Because:





10. Grade 8 stretch. The risky portfolio's return from the bottom to today: $(19,200 \text{ minus } 16,350) \text{ divided by } 16,350, \text{ times } 100 = \underline{\hspace{1cm}}$ percent. That is a big positive number and the portfolio is still down 23 percent from the start. Explain in one sentence why both are true.