

College Mathematics
numerical comparisons

	LAND AREA (in square miles)	POPULATION
Australia	2,900,000	22,600,000
Bangladesh	57,000	160,000,000
Brazil	3,300,000	190,000,000
Canada	3,600,000	34,400,000
China	3,500,000	1,300,000,000
France	247,000	65,000,000
Japan	146,000	130,000,000
Germany	138,000	80,000,000
India	1,150,000	1,200,000,000
Indonesia	705,000	230,000,000
Mexico	742,000	110,000,000
Pakistan	307,000	170,000,000
Russia	6,300,000	140,000,000
United Kingdom	95,000	60,000,000
United States	3,500,000	310,000,000

Answer each of the following questions three different ways:

- (a) using a multiplier [Germany is 0.559 times as big as France.]
(b) as a percent of the reference [Germany's land area is 55.9% of France's.]
(c) using a percent difference [Germany's land area is 44.1% less than France's.]

Round multipliers to the nearest *thousandth* and percentages to the nearest *tenth* of a percent.

1. How big is Canada, compared to the United States?
2. How big is India, compared to the United States?
3. How big is Mexico, compared to the United States?
4. How big is Russia, compared to the United States?
5. How big is the United Kingdom, compared to the United States?
6. How big is Bangladesh, compared to India?
7. How big is India, compared to Pakistan?
8. How big is Pakistan, compared to Bangladesh?

9. How populous is Canada, compared to the United States?
10. How populous is China, compared to the United States?
11. How populous is Indonesia, compared to the United States?
12. How populous is Mexico, compared to the United States?
13. How populous is Russia, compared to the United States?
14. How populous is Bangladesh, compared to India?
15. How populous is India, compared to Pakistan?
16. How populous is Pakistan, compared to Bangladesh?

QUESTIONS TO ASK:

What is the main thing discussed?	(subject)
To what is it being compared?	(reference)
What is the change?	(difference)
How big is the reference?	reference / reference = 1
How big is the change?	difference / reference
How big is the subject?	subject / reference
How big is the reference?	100% of the reference
How big is the change?	P% of the reference
How big is the subject?	(100+P)% of the reference, if the change is a decrease (100-P)% of the reference, if the change is an increase

EXAMPLE 1:

The price of Photon Industries stock went from \$50 to \$157.
Compare the final price to the original price.

What is the main thing discussed?	final price (\$157)
To what is it being compared?	original price (\$50)
What is the change?	price <i>increase</i> (\$107)
How big is the original price?	1 of the original price
How big is the price increase?	2.14 of the original price
How big is the final price?	3.14 of the original price
How big is the original price?	100% of the original price
How big is the price increase?	214% of the original price
How big is the final price?	314% of the original price

EXAMPLE 2:

The price of Quantum Computers stock went from \$400 to \$3.
Compare the final price to the original price.

What is the main thing discussed?	final price (\$3)
To what is it being compared?	original price (\$400)
What is the change?	price <i>decrease</i> (\$397)
How big is the original price?	1 of the original price
How big is the price decrease?	0.9925 of the original price
How big is the final price?	0.0075 of the original price
How big is the original price?	100% of the original price
How big is the price decrease?	99.25% of the original price
How big is the final price?	0.75% of the original price