



Office Hours:

Instructor:

Peter M. Garfield

To Be Announced

garfield@math.ucsb.edu

South Hall 6510

TAs:

Trevor Klar

Wednesdays 1–2PM

trevorklar@math.ucsb.edu

South Hall 6431 F

Garo Sarajian

To Be Announced

gsarajian@math.ucsb.edu

South Hall 6431 F

Sam Sehayek

To Be Announced

ssehayek@math.ucsb.edu

South Hall 6432 P

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Introduction to Percentages

- cent means hundred
- percent means **per hundred** or **out of one hundred**.
- So 50% means 50 out of 100.

To convert a number to a percentage: multiply by 100%

Questions:

1. What is $3/4$ as %?

(A) 0.75%

(B) 30%

(C) 7.5%

(D) 75%

D

2. What is 20% of 30?

(A) 600

(B) 60

(C) 6

(D) 0.6

C

You Try It!

3. Click as you do these problems:

(A) What is 20% of x ?

(B) What is 70% as a fraction?

(C) What is $x\%$ of 50?

(D) What is $\frac{x}{x+1}$ as %?

Answers: (A) $x/5$ (B) $7/10$ (C) $x/2$ (D) $\left(\frac{100x}{x+1}\right)\%$

How many did you get right?

(A) 4 😊

(B) 3

(C) 2

(D) 1

(E) 😞

Mixing Paint

4. If I combine 5 liters of blue paint with 15 liters of red paint, what percentage of red paint is in the combination?

(A) 15%

(B) 5%

(C) 75%

(D) 25%

(E) Other

Answer: C

5. If I combine x liters of blue paint with y liters of red paint, what percentage of blue paint is in the combination?

(A) $\left(\frac{x}{x+y}\right)\%$

(B) $\left(\frac{y}{x+y}\right)\%$

(C) $\left(\frac{100y}{x+y}\right)\%$

(D) $\left(\frac{100x}{x+y}\right)\%$

(E) Other

Answer: D

One More Problem!

6. Express $x\%$ of 4 plus $y\%$ of 3 as a percentage of 12.

Idea: Break down the problem into simple steps **in English**. Explain what I'm doing **to myself**.

Travel problems

7. It is 120 miles from UCSB to LAX airport. If you drive at an average speed of 60 mph how many hours does it take to make the round trip?

(A) 2

(B) 3

(C) 4

(D) 8

Answer: C

More travel problems

8. The Santa Barbara airbus leaves LAX at 3pm and drives to UCSB at an average speed of 30 mph. You leave UCSB at 3pm driving at 90 mph towards LAX. What time do you whiz past the airbus?

(A) 1pm

(B) 3:30pm

(C) 4pm

(D) 4:45pm

(E) 5pm

Answer: **C**

9. Same question/answers, but now you leave UCSB at 4pm

Answer: **D**

Rectangle Problem

10. A rectangle has area A , width W , length L and perimeter P .
Draw a picture then work these out and [i>click](#) as you do them.

(A) Express area in terms of length and width.

(B) Express length in terms of area and width.

(C) Express perimeter in terms of length and width.

(D) Express width in terms of perimeter and length.

(E) Express area in terms of length and perimeter

Another Word Problem

- 11.** Two numbers add up to give 17 and their product is 60. What is the larger of the two numbers?

Method / Plan:

- (i) Name the two unknowns
- (ii) create two equations
- (iii) **solve** equations.

To **solve**: use one equation to eliminate one unknown from second equation, then factor the resulting quadratic.

(A) Working

(B) Talking

(C) Confused

(D) Done

Another one!

12. A rectangle had perimeter 34 inches and area 60 square inches.
What is the length of the shortest side?

(A) Working

(B) Talking

(C) Confused

(D) Done

Bourne, Jason Bourne

13. The road from Santa Barbara (**SB**) to Palo Alto (**PA**) is 300 miles long. Your friend Marie leaves **SB** at noon driving at 60 mph to **PA**.

A bad guy leaves **PA** at 1pm driving along the same road at 60 mph.

At 2pm you find out and decide to save your friend. You drive at 80 mph from **SB**. Will you get to your friend before the bad guy does?

(A) Yes

(B) No

(C) The same time

B

Think - pair - share

There are many ways to work it out

Bourne (continued!)

14. You jump into your car. You need to catch up with Marie before the bad guy. How long until you get to her?

But... your name is Jason Bourne. You always have a plan.

- SB to PA is 300 miles.
- Marie leaves SB at noon driving at 60 mph to PA.
- The bad guy leaves PA at 1pm driving at 60 mph.
- At 2pm you drive at 80mph from SB. At 2:01 you call Marie and tell her to stop her car.

About how many hours before the bad guy do you get to Marie?

(A) 1

(B) $3/4$

(C) $1/2$

(D) at the same time

(E) after the bad guy

Answer: **C**