Welcome To Math 34A! Differential Calculus

Instructor:

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Office Hours:

Mondays 2–3PM
Tuesdays 10:30–11:30AM
Thursdays 1–2PM Not Tomorrow!
or by appointment

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 A,B,C,D 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 $\dfrac{x}{x+1}$ as %?

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

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 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?

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

$$D\ \left(\frac{100x}{x+y}\right)\% \quad E \text{ Other} \qquad \boxed{\text{D}}$$

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?

$$A = 2 \quad B = 3 \quad C = 4 \quad D = 8 \quad \boxed{\text{C}}$$

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= I have answer B= working C=help

Another one!

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

A= I have answer B= working C=help

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) 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 bad guy do you get to Marie?
(A) 1 (B) 3/4 (C) 1/2 (D) same time (E) after $\boxed{\text{C}}$

Waitlist / Crashers

- All approval codes are controlled by the Math Department
  - Before Friday, April 7th:
    - Automatically done from waitlist through GOLD.
    - Approval codes emailed.
    - Approval codes are not currently available.
  - April 8th to April 21st (last day to add)
    - Only students on waitlist and crashing!
    - Approval codes mailed Thursdays: 4/13 and 4/20.
    - You have 24 hours to add.

- If you're crashing, please sign my crashers' list!