

## INTRO TO PERCENTS

## ANSWERS - PAGE 1

IN THIS PACKET WE'RE GOING TO TALK ABOUT PERCENTS. A PERCENT IS A NUMBER OUT OF 100. CHECK OUT THE EXAMPLE TO THE RIGHT. DO YOU SEE HOW 32% MEANS 32 OUT OF 100?

I GET IT, MAX. YOU SHADED 32 OUT OF THE 100 SQUARES TO SHOW 32%.

32% = 32 OUT OF 100

THAT'S CORRECT, POE. HOW ABOUT THIS ONE?

WELL LET'S SEE... YOU SHADED 52 SQUARES, SO THAT WOULD BE 52% OR 52 OUT OF 100.

CORRECT AGAIN. NOW YOU TRY.

### USE THE 100 SQUARES TO WRITE A PERCENT.

1. 24% = 24 OUT OF 100

2. 36% = 36 OUT OF 100

3. 20% = 20 OUT OF 100

4. 100% = 100 OUT OF 100

5. 5% = 5 OUT OF 100

6. 66% = 66 OUT OF 100

$27\% = \frac{27}{100} = 0.27$

A PERCENT IS ALWAYS OUT OF 100, WHICH MAKES IT PRETTY EASY TO REMEMBER.

YOU CAN ALSO WRITE A PERCENT AS A FRACTION OR EVEN A DECIMAL.

## USING PERCENTS IN GRAPHS

## ANSWERS - PAGE 2

WE ALSO USE CIRCLE GRAPHS (PIE GRAPHS) TO SHOW PERCENTS OR AMOUNTS OUT OF 100. THE GRAPH TO THE RIGHT REPRESENTS A WHOLE. IF YOU ADD THE ENTIRE GRAPH YOU HAVE 100%.

IF WE ADD: 50% + 25% + 15% + 10%, WE'LL GET 100%.

SINCE YOU KNOW THAT A CIRCLE GRAPH EQUALS 100%, YOU CAN FIGURE THE AMOUNT OF THE MISSING PIECE?

I KNOW. IF WE ADD THE GIVEN PERCENTS: 12% + 38% + 18% + 26%, WE GET 94%, WHICH MEANS THE MISSING PIECE HAS TO BE 6% TO EQUAL 100%.

### USE EACH GRAPH TO FIND THE MISSING PERCENT.

1. 25%

2. 24%

3. 10%

4. 17%

5. 50%

6. 8%

## PERCENTS AND FRACTIONS - PART 1

## ANSWERS - PAGE 3

YOU KNOW A PERCENT IS OUT OF 100, WHICH MAKES IT EASY TO CHANGE TO A FRACTION.

HELPFUL EXAMPLE

$27\% = 27 \text{ OUT OF } 100 = \frac{27}{100}$

BUT WHAT ABOUT FRACTIONS THAT CAN BE SIMPLIFIED?

THANKS FOR REMINDING ME. YES, SOME FRACTIONS NEED TO BE SIMPLIFIED. JUST REMEMBER, WHATEVER YOU DO TO THE TOP YOU NEED TO DO TO THE BOTTOM.

$28\% = 28 \text{ OUT OF } 100 = \frac{28}{100} \div 4 = \frac{7}{25}$

IN CASE YOU WERE WONDERING, THE TOP NUMBER IN A FRACTION IS CALLED THE NUMERATOR, AND THE BOTTOM NUMBER IS CALLED THE DENOMINATOR.

### WRITE EACH PERCENT AS A FRACTION IN SIMPLEST FORM.

1. 46%  $\frac{46}{100} \div 2 = \frac{23}{50}$

2. 11%  $\frac{11}{100}$

3. 75%  $\frac{3}{4}$

4. 7%  $\frac{7}{100}$

5. 60%  $\frac{3}{5}$

6. 4%  $\frac{1}{25}$

7. 83%  $\frac{83}{100}$

8. 50%  $\frac{1}{2}$

YOU CAN ALSO CHANGE A FRACTION INTO A PERCENT. CHECK OUT THE EXAMPLES BELOW.

A.  $\frac{39}{100} = 39\%$

B.  $\frac{85}{100} = 85\%$

SEE HOW THE FRACTIONS ARE OUT OF 100. IF THE BOTTOM NUMBER (DENOMINATOR) IS 100 THEN YOU CAN QUICKLY SWITCH THE TOP NUMBER (NUMERATOR) TO A PERCENT.

### WRITE EACH FRACTION AS A PERCENT.

9.  $\frac{16}{100} = 16\%$

10.  $\frac{30}{100} = 30\%$

11.  $\frac{94}{100} = 94\%$

12.  $\frac{5}{100} = 5\%$

13.  $\frac{77}{100} = 77\%$

14.  $\frac{1}{100} = 1\%$

15.  $\frac{45}{100} = 45\%$

16.  $\frac{23}{100} = 23\%$

## PERCENTS AND FRACTIONS - PART 2

## ANSWERS - PAGE 4

SOMETIMES THE FRACTION LOOKS LIKE IT'S NOT OUT OF 100, BUT YOU CAN ACTUALLY REWRITE IT. AFTER YOU CHANGE THE BOTTOM NUMBER (DENOMINATOR) TO 100 YOU CAN QUICKLY CHANGE IT TO A PERCENT.

A.  $\frac{13}{50} \times 2 = \frac{26}{100} = 26\%$

B.  $\frac{10}{20} \times 5 = \frac{50}{100} = 50\%$

REMEMBER, WHAT EVER YOU DO TO THE BOTTOM YOU DO TO THE TOP.

WRITE EACH FRACTION AS A PERCENT.

1.  $\frac{9}{25} = 36\%$

2.  $\frac{7}{10} = 70\%$

3.  $\frac{2}{5} = 40\%$

4.  $\frac{18}{25} = 72\%$

5.  $\frac{3}{10} = 30\%$

6.  $\frac{1}{2} = 50\%$

7.  $\frac{9}{20} = 45\%$

8.  $\frac{3}{4} = 75\%$

OCCASIONALLY YOU'LL NEED TO DIVIDE A FRACTION TO CHANGE IT TO A PERCENT. I USE TO GET CONFUSED ON HOW TO DO THIS UNTIL SOMEONE TOLD ME THE STORY OF THE FRACTION HATING MONSTER WHO LOVES PUSHING FRACTIONS OVER.

THAT'S MEAN. I'M NOT A HATER. I JUST LOVE PUSHING FRACTIONS OVER. DO YOU SEE WHAT HAPPENS AFTER IT FALLS?

AFTER YOU DIVIDE, YOU GET ABOUT (APPROXIMATELY) .43. TO CHANGE THAT TO A PERCENT MULTIPLY IT BY  $\frac{100}{100}$  OR JUST MOVE THE DECIMAL 2 PLACES TO THE RIGHT.

$.43 \times \frac{100}{100} = \frac{43 \times 100}{100} = \frac{43}{100} = 43\%$

$43\% = 43\%$

### WRITE EACH FRACTION AS A PERCENT.

9.  $\frac{1}{6} \approx 16.7\%$

10.  $\frac{5}{8} = 62.5\%$

11.  $\frac{2}{3} \approx 66.7\%$

12.  $\frac{6}{15} = 40.0\%$

13.  $\frac{3}{9} = 33.3\%$

14.  $\frac{6}{7} \approx 85.7\%$

15.  $\frac{10}{12} \approx 83.3\%$

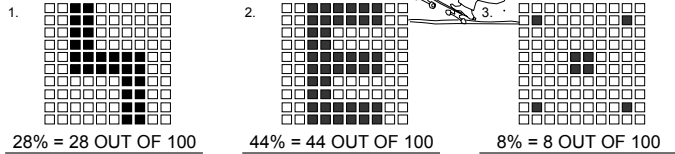
16.  $\frac{4}{11} \approx 36.4\%$

## REVIEW

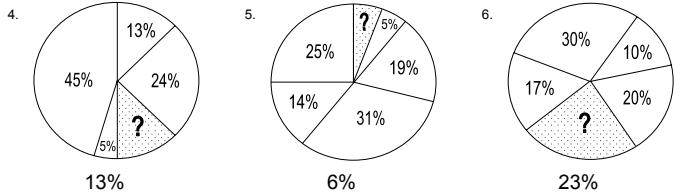
## ANSWERS - PAGE 5

BEFORE WE MOVE ON, LET'S TAKE A MOMENT TO REVIEW. YOU KNOW PRACTICE MAKES PERFECT.

### USE THE 100 SQUARES TO WRITE A PERCENT.



### USE EACH GRAPH TO FIND THE MISSING PERCENT.



### WRITE EACH PERCENT AS A FRACTION IN SIMPLEST FORM.

7.  $\frac{9}{100}$  8.  $\frac{25}{100} = \frac{1}{4}$  9.  $\frac{73}{100}$  10.  $\frac{36}{100} = \frac{9}{25}$
11.  $\frac{90}{100} = \frac{9}{10}$  12.  $\frac{33}{100}$  13.  $\frac{42}{100} = \frac{21}{50}$  14.  $\frac{100}{100} = 1$

### WRITE EACH FRACTION AS A PERCENT.

15.  $\frac{4}{100} = 4\%$  16.  $\frac{26}{39} = 66.7\%$  17.  $\frac{2}{11} = 18.2\%$  18.  $\frac{12}{20} = 60\%$
19.  $\frac{16}{32} = 50\%$  20.  $\frac{4}{10} = 40\%$  21.  $\frac{20}{25} = 80\%$  22.  $\frac{5}{7} = 71.4\%$

## PERCENTS AND DECIMALS

## ANSWERS - PAGE 6

THE NEXT TOPIC IS A LITTLE EASIER. WE'RE GOING TO SHOW YOU THE MATHEMATICAL WAY AND THEN SHOW YOU A SIMPLE WAY TO SOLVE THESE PROBLEMS.

TO CHANGE A PERCENT TO A DECIMAL ALL YOU NEED TO DO IS DIVIDE BY 100.

47% = 47 OUT OF 100 =  $\frac{47}{100} = 47 \div 100 = .47$

IF YOU LOOK AT THE PROBLEM DO YOU SEE AN EASIER WAY TO CHANGE A PERCENT TO A DECIMAL?

47% = .47

HEY MAX, ALL WE'RE DOING IS MOVING THE DECIMAL TWO PLACES TO THE LEFT.

OR

IF THE DECIMAL IS NOT IN SIGHT IT'S ON THE RIGHT.

47% = 47.% = .47 = .47

JUST MOVE THE DECIMAL 2 PLACES TO THE LEFT.

### WRITE EACH PERCENT AS A DECIMAL.

1. 5% = .05 2. 34% = .34 3. 99% = .99 4. 60% = .6 5. 81% = .81
6. 22% = .22 7. 75% = .75 8. 18% = .18 9. 3% = .03 10. 100% = 1

TO CHANGE A DECIMAL TO A PERCENT YOU MULTIPLY THE DECIMAL BY  $\frac{100}{100}$ , WHICH IS THE SAME AS 1.

OR JUST MOVE THE DECIMAL 2 PLACES TO THE RIGHT.

$.29 \times \frac{100}{100} = \frac{.29 \times 100}{100} = \frac{29}{100} = 29\%$  OR  $.29 = .29 = 29\%$

IN CASE YOU WONDERING...ANYTHING TIMES 1 IS THE SAME ANSWER. SO WE'RE NOT REALLY CHANGING THE NUMBER, BUT RATHER ITS APPEARANCE.

SEE HOW THE SAME NUMBER IS ON THE TOP AND BOTTOM? THEY ALL EQUAL 1.

### WRITE EACH DECIMAL AS A PERCENT.

11. 0.7 = 70% 12. 0.35 = 35% 13. 0.09 = 9% 14. 0.21 = 21% 15. 0.01 = 1%
16. 0.44 = 44% 17. 0.9 = 90% 18. 0.62 = 62% 19. 0.5 = 50% 20. 0.27 = 27%

## PERCENT OF A NUMBER

## ANSWERS - PAGE 7

SO THERE YOU HAVE IT. NOW YOU KNOW HOW TO REWRITE PERCENTS, FRACTIONS, AND DECIMALS.

BUT, MAX, WHEN ARE WE GOING TO USE THIS IN THE REAL WORLD?

GOOD QUESTION, LET'S TAKE A LOOK AT THE MOST COMMON USE OF WHAT WE'VE JUST LEARNED.

I'M SURE YOU'VE HEARD SOMEONE SAY SOMETHING LIKE: JILL ONLY PAID 50% OF THE ACTUAL PRICE OR MIKE'S FOOTBALL TEAM WON 70% OF THEIR GAMES THIS SEASON. BUT DO YOU KNOW HOW TO FIGURE OUT THE AMOUNT?

LET'S DO AN EXAMPLE TOGETHER. I RUN 20 MILES EVERYDAY. BUT YESTERDAY I ONLY RAN 80% OF THE DISTANCE. HOW FAR DID I RUN?

PERCENT COMPLETED

80% OF 20

1. .80 OF 20

2. .80 X 20

3. 16

ORIGINAL AMOUNT

WHAT YOU NEED TO DO

1. CHANGE THE PERCENT TO A DECIMAL.

2. CHANGE THE "OF" TO MULTIPLICATION.

3. SOLVE.

SO WHAT DO YOU THINK? JUST FOLLOW THESE SIMPLE STEPS AND YOU CAN FIND THE PERCENT OF ALMOST ANY NUMBER.

### FIND THE PERCENT OF EACH NUMBER.

1. 5% OF 20  
 $.05 \times 20 = 1$
2. 20% OF 12  
2.4
3. 50% OF 34  
17
4. 35% OF 10  
3.5
5. 10% OF 40  
4
6. 1% OF 40  
0.4
7. 75% OF 60  
45
8. 8% OF 100  
8
9. 40% OF 25  
10
9. WHAT IS 30% OF 85?  
25.5
10. WHAT IS 95% OF 30?  
28.5
11. FIND 3% OF 120.  
3.6
12. KALIE BOUGHT A SKATEBOARD ON SALE FOR 75% OF THE REGULAR PRICE. IF IT NORMALLY SELLS FOR \$80, HOW MUCH DID SHE PAY?  
\$60
13. IN THE PAST TWO YEARS, CARL'S FOOTBALL TEAM HAS WON 90% OF THEIR GAMES. EACH YEAR THE TEAM PLAYS 10 GAMES, HOW MANY GAMES DID THEY WIN?  
18 GAMES

## LET'S WRAP IT UP

## ANSWERS - PAGE 8

BEFORE YOU GO TAKE A MOMENT TO SEE WHAT YOU LEARNED.

### WRITE EACH PERCENT AS A FRACTION IN SIMPLEST FORM.

1. 96% =  $\frac{96}{100} = \frac{24}{25}$  2. 53% =  $\frac{53}{100}$  3. 75% =  $\frac{3}{4}$  4. 18% =  $\frac{9}{50}$  5. 80% =  $\frac{4}{5}$

### WRITE EACH FRACTION AS A PERCENT.

6.  $\frac{7}{20} = 35\%$  7.  $\frac{24}{48} = 50\%$  8.  $\frac{36}{100} = 36\%$  9.  $\frac{3}{8} = 37.5\%$  10.  $\frac{12}{14} = 85.7\%$

### WRITE EACH PERCENT AS A DECIMAL.

11. 33% = .33 12. 8% = .08 13. 20% = .2 14. 14% = .14 15. 100% = 1

### WRITE EACH DECIMAL AS A PERCENT.

16. 0.03 = 3% 17. 0.41 = 41% 18. 0.8 = 80% 19. 0.02 = 2% 20. 0.17 = 17%

### FIND THE PERCENT OF EACH NUMBER.

21. 45% OF 30  
 $.45 \times 30 = 13.5$
22. 6% OF 50  
3
23. 25% OF 200  
50
24. 90% OF 8  
7.2
25. NORA DONATED 10% OF THIS WEEK'S SALARY TO THE LOCAL CHILDREN'S HOSPITAL. IF SHE GETS PAID \$1,000 A WEEK, HOW MUCH DID SHE DONATE?  
\$100
26. KOE TOOK A 60 PROBLEM TEST. HE GOT 85% OF THE QUESTIONS CORRECT. HOW MANY ANSWERS DID KOE GET CORRECT?  
51 CORRECT