MATH 65 **Final Exam Pre-Test** ANSWERS

Round each number to the indicated place.

1. 3,052 nearest hundred

place → 0 (round up (add 1 to place digit))

+ 1

3,100

2. 29,602,815 nearest million

place → 6 (round up)

29,602,815

+ 1

30,000,000

{ 1. Identify place digit
2. use next digit (rounding digit) to determine whether to round up or down.

Based on the bar graph, at right, answer each question with a sentence.

3. How much higher is Mt. Everest (Nepal) than Mt. Ararat (Turkey)?

Means Subtract

29,035 − 16,804

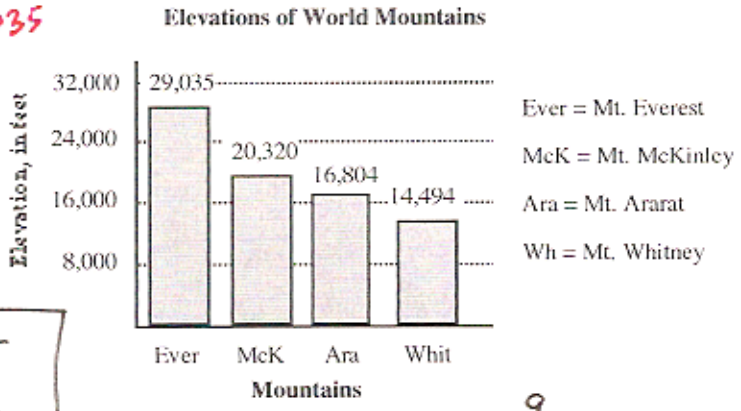
8

29,035

− 16,804

12,231

Mt. Everest is 12,231 feet higher than Mt. Ararat.



4. How much higher is Mt. McKinley (Alaska) than Mt. Whitney (California)?

This will require "regrouping" of a lot of digits.

Mt. Mckinley is 5,826 feet higher than mt. whitney.

9

1 10 12 11

20,320

− 14,494

5,826

Answer as indicated.

5. *Divide* 2,465 ÷ 17

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  145
17)2,465
  -17
   76
  -68
   85
  -85
    0   ← no remainder
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To divide 17 into 76, I rounded each number up. This helped by thinking of it as 20 divided into 80, which is 4; 4×17=68.

6. Expand 8^3 and find its value.

$8^3 = 8 \cdot 8 \cdot 8$

1st, multiply two of them; then multiply by the third one:

$8^3 = 8 \cdot 8 \cdot 8$

$= 64 \cdot 8$

3

64

× 8

512

$= 512$

A prime number is one that is divisible by only 1 and itself. The list of primes up to 29 : 2, 3, 5, 7, 11, 13, 17, 19, 23, 29.

7. Of the numbers 9, 0, 45, 23, 1, and 29, determine which are prime, which are composite, and which are neither.

Prime 23, 29

Composite 9, 45

Neither 0, 1

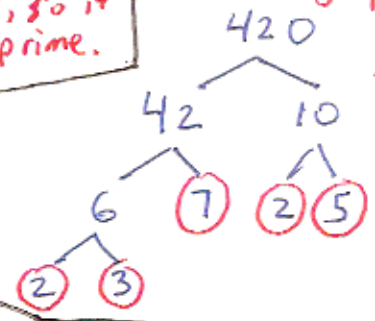
9 = 3·3 as well as 9·1

45 = 5·9, so it is not prime.

the 1st possible prime number is 2. 1 is not prime because its factors are not different: 1·1=1

8. Find the prime factorization of 420. Write the answer two ways: with and without exponents.

The "tree" diagram is probably the quickest for finding prime factors. Another technique, the "division method," can also be used.



$420 = 2 \cdot 2 \cdot 3 \cdot 5 \cdot 7$

$420 = 2^2 \cdot 3 \cdot 5 \cdot 7$ with exponents

Evaluate each expression.

For most of these, I change subtraction to "adding the opposite." This step is not required, but is recommended.

9. $-8 + (-6)$

$= -14$

The sum of two negative numbers is a "larger" neg. number.

10. $-2 + 15$

$= 13$

11. $-9 - 4$

$= -9 + (-4)$

$= -13$

12. $5 - 12$

$= 5 + (-12)$

$= -7$

13. $17 - (-8)$

$= 17 + 8$

$= 25$

14. $-2 - (-8)$

$= -2 + 8$

$= 6$

15. $(-9) \cdot (-1)$

$= 9$

16. $8 \cdot (-7)$

$= -56$

17. $-3 \cdot (-2) \cdot (-5) \cdot 4$

$= +6 \cdot (-20)$

$= -120$

18. $\frac{-40}{-8}$

$= +5$

this "plus" sign is here just to emphasize that the answer is positive. The plus sign is not required.

19. $\frac{36}{-12}$

$= -3$

20. $18 - 7 + (-14) - (-6)$

$= 18 + (-7) + (-14) + 6$

We can rearrange these terms, if we want, to write the positives together separately from the negatives:

$= 18 + 6 + (-7) + (-14)$

$= 24 + (-21)$

$= 3$ = 3

21. Evaluate $x^2 + y$ by replacing **x** with 3 and **y** with -10.

$= (3)^2 + (-10)$

$= 9 + (-10)$

$= \boxed{-1}$

If a replacement value is negative, such as "y with -10," it is usually necessary to write -10 with parentheses around it.

Evaluate each expression using the order of operations. Show all steps.

22. $6 - \sqrt{64}$

$= 6 - 8$

$= 6 + (-8)$

$= \boxed{-2}$

23. $9^2 - 10^2$

$= 81 - 100$

$= 81 + (-100)$

$= \boxed{-19}$

24. $|-7-(-8)|$

$= |-7+8|$

$= |1|$

$= \boxed{1}$

Evaluate the numerical value of each formula with the given replacement values.

25. $m = \frac{y-k}{x-h}$ $\quad y = 12,\ k = 6,\ x = 3,\ h = 5$

$m = \frac{12-6}{3-5}$

$m = \frac{6}{3+(-5)}$

$m = \frac{6}{-2} \rightarrow \boxed{m = -3}$

26. $m = \frac{y-k}{x-h}$ $\quad y = 8,\ k = -4,\ x = -2,\ h = 1$

$m = \frac{8-(-4)}{-2-1}$

$m = \frac{8+4}{-2+(-1)}$

$m = \frac{12}{-3} \rightarrow \boxed{m = -4}$

Simplify by combining like terms, if possible.

When combing like terms, the variable structure of the terms doesn't change.

27. $-5y^3 - 7y^3$

$= -5y^3 + (-7y^3)$

$= \boxed{-12y^3}$

28. $6x - 4x - (-x)$

$= (6x + (-4x)) + x$

$= 2x + x$

$= \boxed{3x}$

29. $w^3 - 3w - 2w^3 + 6w$

$= 1w^3 - 2w^3 - 3w + 6w$

$= 1w^3 + (-2w^3) + (-3w) + 6w$

$= \boxed{-1w^3 + 3w}$ or, $\boxed{-w^3 + 3w}$

Find the product. *Rewrite each expression using the Distributive Property.*

30. $-4(-2x^2)$

$= \boxed{8x^2}$

31. $2(-8y)$

$= \boxed{-16y}$

32. $6(3w - 5)$

$= \boxed{18w - 30}$

33. $-3(-5q + 7)$

$= \boxed{15q - 21}$

Remember, "the sign in front of a term belongs to that term." This is especially important in distributing, in #32 and 33.