Basic Skills Practice Test **Name**_____

Conceptual Questions Some of these items will be on the actual test

1. What is the first step when adding or subtracting mixed numbers or fractions?

Find a **common denominator**

2. What is the definition of "Rational Numbers"?

Any number that can be written as a **fraction** and when **written as a decimal** will either **repeat** or **terminate**

3. What is the first step when multiplying or dividing mixed numbers?

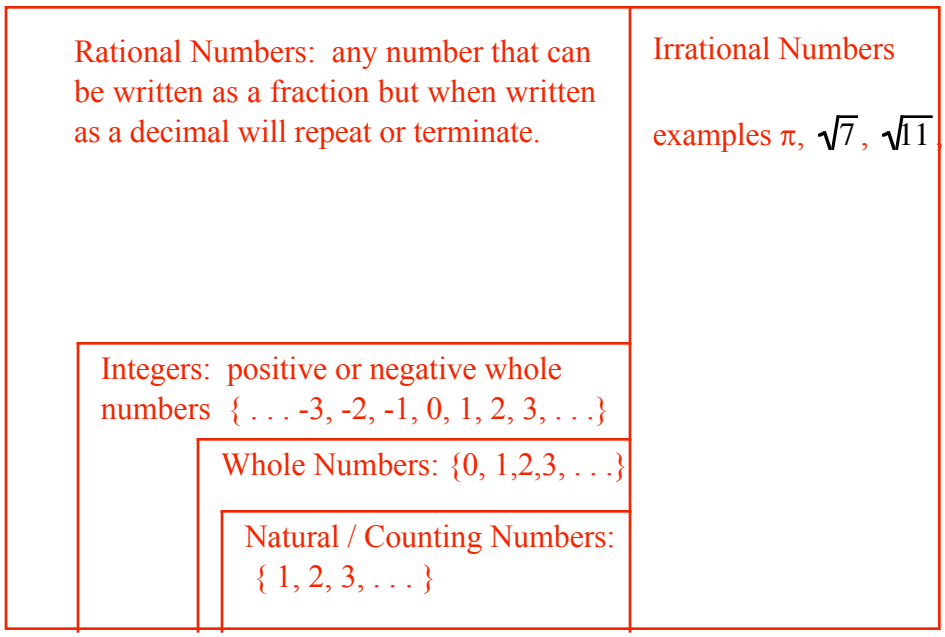
Create **Improper Fractions**

4. What is the definition of "Integer Numbers"?

Any number that is a **positive** or **negative whole number** falls into this number set.

5. Explain the "Universe of Numbers" by illustrating the various number sets and how each is related.

Real Numbers - Any number that one can write



5.1 Provide an example of each **number set**.

Natural / Counting Numbers - { 1, 2, 3, . . . }
Whole Numbers - {0, 1,2,3, . . .}
Integer Numbers - { . . . -3, -2, -1, 0, 1, 2, 3, . . .}
Rational Numbers - any number that can be written as a fraction but when written as a decimal will repeat or terminate.
Irrational Numbers -any number that when written as a decimal will **not** repeat or terminate
Real Numbers -Any number that one can write

6. Illustrate the borrowing idea with this problem.

$$25\frac{1}{3} - 20\frac{3}{4}$$

25 – 20 | 1/3 – 3/4 : Work whole with whole and part with part
5 | 4 / 12 – 9 / 12
5 | – 5 / 12 : signs do not match so borrow
4 12 / 12 | – 5 / 12 : equivalent statement 5 = 4 12 / 12
4 7 / 12 : then work part with part so signs on mixed number match

Knowing the Squares (Should take less than a minute to do entire section)

1. 13^2 = 1. 169
2. 16^2 = 2. 256
3. 18^2 = 3. 324
4. 19^2 = 4. 361
5. 21^2 = 5. 441
6. 22^2 = 6. 484
7. 23^2 = 7. 529
8. 25^2 = 8. 625

Addind and Subtracting Integers

1. $25 + 14 - 11$ 1. _____

39 – 11
28

2. $-17 + (-13) + 3$ 2. _____

–30 + 3
–27

3. $7 - (-5) - 19$ 3. _____

12 – 19
–7

Multiplying and Dividing Integers

4. $(-12)(5) \div (-6)$ 4. _____

–60 / – 6
10

5. $(-4)(-3) \div 2(-6)$ 5. _____

12 / 2 (–6)
6 (–6)
–36

6. $-5 \bullet -3 \bullet 0 \bullet 7$ 6. _____

15 (0) (7)
0 (7)
0

Addind and Subtracting Rationals

7. $-8\frac{1}{4}+12\frac{2}{5}-3\frac{7}{10}$ 7. _____

–8 + 12 –3 | –1/4 + 2/5 – 7/10 : Work whole with whole and part with part

1 | –5 / 20 + 8 / 20 – 14 / 20

1 | – 11 / 20 : signs do not match so borrow

20 / 20 | – 11 / 20 : equivalent statement 1 = 20 / 20

9 / 20 : then work part with part so signs on mixed number match

8. $-4\frac{2}{5}-\left(-4\frac{1}{2}\right)-2\frac{3}{5}$ 8. _____

–4 + 4 –2 | –2/5 + 1/2 – 3/5 : Work whole with whole and part with part

–2 | –4 / 10 + 5 / 10 – 6 / 10

–2 | – 5 / 10 : signs match so no need to borrow

– 2 1 / 2 : just reduce fraction

Multiplying and Dividing Rationals

9. $\left(-\frac{1}{5}\right)\div\frac{2}{15}\bullet\left(-1\frac{1}{7}\right)$ 9. _____

–1 / 5 ˚ 15 / 2 ˚ –8 /7 : get improper fractions and reciprocate any divisors

–1 / 1 ˚ 3 / 1 ˚ –4 /7 : reduce any numerator with any denominator

12 / 7 : just reduce fraction

1 5 / 7

10. $\left(-4\frac{2}{3}\right)\div\left(-3\frac{1}{2}\right)\bullet 1\frac{1}{5}$ 10. _____

–14 / 3 ÷ –7 / 2 ˚ 6 / 5 : get improper fractions

–14 / 3 ˚ –2 / 7 ˚ 6 / 5 : reciprocate any divisors

–2/ 1 ˚ 2 / 1 ˚ –2 /5 : reduce any numerator with any denominator

8 / 5 : just reduce fraction

1 3 / 5

11. $\frac{8}{15}\div\left(-\frac{2}{5}\right)\div\left(-\frac{1}{2}\right)$ 11. _____

8 / 15 ˚ –5 / 2 ˚ –2 / 1 : reciprocate any divisors

8 / 3 ˚ –1 / 1 ˚ –1 /1 : reduce any numerator with any denominator

8 / 3 : just reduce fraction

2 2 / 3

Order of Operations

12.
$$2\left[(16\div 8)-(-2)\right]+4$$
$$2\left[(2)-(-2)\right]+4$$
$$2\left[2+2\right]+4$$
$$2\left[4\right]+4$$
$$8+4$$
$$12$$

13.
$$\frac{2}{3}\left[8(2-5)^2+3\bullet 2\right]$$
$$\frac{2}{3}\left[8(-3)^2+3\bullet 2\right]$$
$$\frac{2}{3}\left[8\bullet 9+6\right]$$
$$\frac{2}{3}\left[72+6\right]$$
$$\frac{2}{3}\left[78\right]$$
$$52$$

Order of Operations

14.
$$6\left[3-(-4+2)\div 2\right]$$
$$6\left[3-(-2)\div 2\right]$$
$$6\left[3--1\right]$$
$$6\left[3+1\right]$$
$$6[4]$$
$$24$$

15.
$$9\left[\left(\frac{5}{8}-\frac{1}{4}\right)\bullet\frac{1}{9}\div\frac{3}{4}\right]$$
$$9\left[\left(\frac{5}{8}-\frac{2}{8}\right)\bullet\frac{1}{9}\bullet\frac{4}{3}\right]$$
$$9\left[\left(\frac{3}{8}\right)\bullet\frac{1}{9}\bullet\frac{4}{3}\right]$$
$$9\left[\left(\frac{1}{2}\right)\bullet\frac{1}{9}\bullet\frac{1}{1}\right]$$
$$\frac{9}{1}\left[\frac{1}{18}\right]$$
$$\frac{1}{2}$$

(Show all work since answers given)

16. $\left(-\frac{3}{5}\right)^2 - \frac{3}{5} \bullet 2\frac{3}{5} + \frac{7}{10} = -\frac{1}{2}$

$\left(\frac{9}{25}\right) - \frac{3}{5} \bullet \frac{13}{5} + \frac{7}{10}$

$\left(\frac{9}{25}\right) - \frac{39}{25} + \frac{7}{10}$

$-\frac{30}{25} + \frac{7}{10}$

$-\frac{6}{5} + \frac{7}{10}$

$-\frac{12}{10} + \frac{7}{10}$

$-\frac{5}{10}$

$-\frac{1}{2}$

17. $\left[\frac{1}{6} \div \frac{5}{9} - \left(\frac{1}{5}\right)^2\right] - \frac{7}{10} = -\frac{11}{25}$

$\left[\frac{1}{6} \bullet \frac{9}{5} - \frac{1}{25}\right] - \frac{7}{10}$

$\left[\frac{1}{2} \bullet \frac{3}{5} - \frac{1}{25}\right] - \frac{7}{10}$

$\left[\frac{3}{10} - \frac{1}{25}\right] - \frac{7}{10}$

$\left[\frac{15}{50} - \frac{2}{50}\right] - \frac{35}{50}$

$-\frac{22}{50}$

$-\frac{11}{25}$

Exploring Patterns

A. 1, 2, 4, 8, 10, 20, 22, ___44___ , ___46___ , ___92___

x2 + 2

B. 33, 39, 40, 47, 48, 56, 57, ___66___ , ___67___ , ___77___

+6 +1 + 7 + 1 + 8 + 1 + 9 +1 +10

C. 4, 7, 12, 19, 28, 39, 52, ___67___ , ___84___ , ___103___

+3 +5 +7 +9 + 11 . . .

D. 169, 196, 225, 256, 289, 324, ___361___ , ___400___ , ___441___

squares

E. 10, 8, 16, 18, 9, 6, 18, 21, 7, 3 ___12___ , ___16___ , ___4___

–2, x 2, +2, ÷2, –3, x 3, +3, ÷3, –4, x 4, +4, ÷4

F. 80, 77, 76, 72, 71, 66, 65, ___59___ , ___58___ , ___51___

– 3 – 1 – 4 – 1 –5 – 1 . . .