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 first step when multiplying or dividing mixed numbers?

Create **Improper Fractions**

3. Match each number system with the appropriate number set.

_____ Natural / Counting Numbers - C

_____ Whole Numbers - E

_____ Integer Numbers - F

_____ Rational Numbers - A

_____ Irrational Numbers - B

_____ Real Numbers - D

A. $\{ -3\frac{1}{5}, -\frac{2}{1}, 0, 1\frac{2}{3}, \sqrt{25} \}$

B. $-\sqrt{11}, -\frac{\sqrt{9}}{2}, \sqrt{3}, \pi, \sqrt{22}$

C. $\{ 1, 2, 3, \ldots \}$

D. $\{ -2\frac{1}{5}, -\frac{\sqrt{7}}{2}, 0, 1\frac{2}{3}, \sqrt{36}, \sqrt{41} \}$

E. $\{ 0, 1, 2, 3, \ldots \}$

F. $\{ \ldots -3, -2, -1, 0, 1, 2, 3, \ldots \}$

4. Illustrate the borrowing idea with this problem.

$$11\frac{1}{4} - 3\frac{2}{5}$$

11 – 3 | 1/4 – 2/5 : Work whole with whole and part with part

8 | 5 / 20 – 8 / 20

8 | – 3 / 20 : signs do not match so borrow

7 20 / 20 | – 3 / 20 : equivalent statement 8 = 7 20 / 20

7 17 / 20 : 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. $14^2 = 196$ 1. _____

2. $15^2 = 225$ 2. _____

3. $16^2 = 256$ 3. _____

4. $19^2 = 361$ 4. _____

5. $21^2 = 441$ 5. _____

6. $23^2 = 529$ 6. _____

7. $24^2 = 576$ 7. _____

8. $25^2 = 625$ 8. _____

Addind and Subtracting Integers

1. $15 - (-3) + 2$ 1. _____

   $18 + 2$

   20

2. $-22 + (-9) + 3$ 2. _____

   $-31 + 3$

   -28

3. $6 - (-17) + 3$ 3. _____

   $23 + 3$

   26

Multiplying and Dividing Integers

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

   $-60 / -6$

   10

5. $(-100) \div (-10)(-6) \div 12$ 5. _____

   $10\ (-6)\ /\ 12$

   $-60\ /\ 12$

   -5

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

   $15\ (\ 0\ )\ (7)$

   $0\ (\ 7\ )$

   0

Addind and Subtracting Rationals

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

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

– 9 | – 3 / 8 + 4 / 8 – 6 / 8

– 9 | – 5 / 8 : signs do not match so borrow

: signs match so no need to borrow

– 9 5 / 8 : just reduce fraction

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 do not match so borrow

: signs match so no need to borrow

– 2 1 / 2 : just reduce fraction

Multiplying and Dividing Rationals

9. $\left(-3\frac{1}{5}\right)\bullet 1\frac{1}{5}\div\left(-\frac{2}{5}\right)$ 9. _____

–16 / 5 ˚ 6 / 5 ÷ 2 / 5 : get improper fractions

–16 / 3 ˚ 6 / 5 ˚ –5 / 2 : reciprocate any divisors

– 16/ 1 ˚ 3 / 5 ˚ –1 / 1 : reduce any numerator with any denominator

48 / 5 : just reduce fraction

9 3 / 5

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

Order of Operations **(Show all work since answers given)**

14.
$$12\left[10-\frac{(5^2-6)\bullet 3}{6}\right]=6$$
$$12\left[10-\frac{(25-6)\bullet 3}{6}\right]$$
$$12\left[10-\frac{(19)\bullet 3}{6}\right]$$
$$12\left[10-\frac{(19)\bullet 1}{2}\right]$$
$$12\left[10-9\frac{1}{2}\right]$$
$$12\left[\frac{1}{2}\right]$$
$$6$$

15.
$$5\left[\frac{1}{2}+\left(\frac{3}{5}\bullet\frac{5}{6}\right)\div\frac{5}{8}\right]=6\frac{1}{2}$$
$$5\left[\frac{1}{2}+\left(\frac{1}{1}\bullet\frac{1}{2}\right)\bullet\frac{8}{5}\right]$$
$$5\left[\frac{1}{2}+\left(\frac{1}{2}\right)\bullet\frac{8}{5}\right]$$
$$5\left[\frac{1}{2}+\left(\frac{1}{1}\right)\bullet\frac{4}{5}\right]$$
$$5\left[\frac{5}{10}+\frac{8}{10}\right]$$
$$\frac{5}{1}\left[\frac{13}{10}\right]$$
$$\frac{13}{2}$$
$$6\frac{1}{2}$$

(Show all work since answers given)

16. $9\left[\left(\frac{5}{8}-\frac{1}{4}\right)\bullet\frac{1}{9}\div\frac{3}{4}\right]=\frac{1}{2}$

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

$9\left[\left(\frac{3}{8}\right)\bullet\frac{1}{9}\bullet\frac{4}{3}\right]$

$9\left[\left(\frac{1}{2}\right)\bullet\frac{1}{9}\bullet\frac{1}{1}\right]$

$9\left[\frac{1}{18}\right]$

$\frac{9}{1}\left[\frac{1}{18}\right]$

$\frac{1}{2}$

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

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

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

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

$\left[\frac{15}{50}-\left(\frac{2}{50}\right)\right]-\frac{7}{10}$

$\left[\frac{13}{50}\right]-\frac{35}{50}$

$\frac{-22}{50}$

$\frac{-11}{25}$

Exploring Patterns

A. 11, 13, 16, 20, 25, 31, 38, ___46___ , ___55___ , ___65___
+ 2 + 3 + 4 + 5 + 6 . . .

B. 100, 121, 144, 169, 196, ___225___ , ___256___ , ___289___
+ 10^2 + 11^2 + 13^2 + 14^2 + 15^2 . . .

C. 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

D. 33, 39, 40, 47, 48, 56, 57, ___66___ , ___67___ , ___77___
+ 6 + 1 + 7 + 1 + 8 . . .