Answers for sample Test

Math 141 ____ NAME: Key
Test III, Spring 2004 100
chapters 6, 7 & 8 Seat: ____
Partial credit is based on work shown!
6pts

1. a. Using a method we discussed in class, compare the size of $\frac{7}{10}$ *and* $\frac{11}{15}$. Which is bigger? $\frac{11}{15}$

.222-225

Use LCD or anyother commonden. $\frac{7}{10} = \frac{21}{30}$ $\frac{11}{15} = \frac{22}{30}$ $\frac{105}{150} < \frac{110}{150}$

or Cross mult. $7(15) < 10(11)$ $105 < 110$

or convert to decimals $\frac{7}{10} = .7$ $\frac{11}{15} = .7\overline{3}$

b. Find a fraction **between** $\frac{7}{10}$ *and* $\frac{11}{15}$. Show your work.

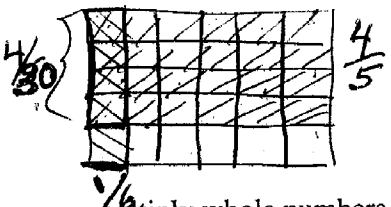
$\frac{7}{10} = \frac{42}{60}$ $\frac{11}{15} = \frac{44}{60}$ so $\frac{43}{60}$ is better also $\frac{105}{150}$ to $\frac{109}{150}$ are between also $\frac{7+11}{10+15} = \frac{18}{25}$

c. Which property of fractions does this illustrate? density

6pts

2. **Show** how to illustrate $\frac{1}{6}$ *of* $\frac{4}{5}$, using a rectangular diagram (with each fraction and answer labeled).

p.242



6pts

3. When you multiply whole numbers the product is larger than either of the original numbers.
   a. Is this also true for proper fractions? No **Explain** and give an example:

When you multiply proper fractions you are finding a fractional part of the other fraction and thus the answer is smaller than either of the original #s. See #2 for example $\frac{1}{6} \times \frac{4}{5} = \frac{4}{30}$ which is < orig #s

   b. Is this also true for improper fractions? No **Explain** and give an example:

When you multiply improper fractions the #s are > 1. So you are taking more than all of the #. Ex. $\frac{5}{2} \times \frac{4}{3} = \frac{20}{6} = 3\frac{2}{6} = 3\frac{1}{3}$ > than orig #. $1\frac{1}{2} \times 1\frac{1}{3} =$

8pts

4. a. List the elements in the set of integers: { ... -3, -2, -1, 0, 1, 2, 3, ... }
   b. Is the set of **integers** closed for **subtraction**? yes
   Explain: When you subtract any two integers the answer is always another integer.

   c. Is the set of **integers** closed for **division**? No
   Explain: When you divide two integers the answer can be a # that is not an integer.

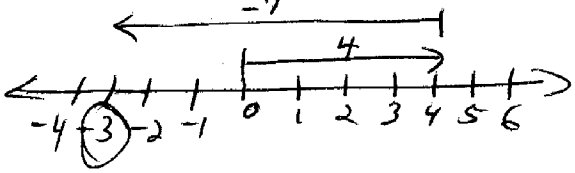
Example: $5 \div -8 = \left(-\frac{5}{8}\right)$ which is not an integer.

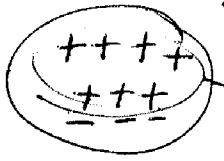
26

10pts

5. We studied four different ways to illustrate **integer arithmetic**.

a. Use a **number line** and **a set model** to illustrate why $(4)-(7)=-3$.





start with 4 positives. You need to take away 7 positives. You are left with 3 negatives.

b. Building from the fact that (2)(- 4) = -8, finish this **number pattern** to illustrate why (-3)(- 4) = +12.

(2) (- 4) = - 8
(1) (- 4) = - 4
(0) (- 4) = 0
-1 (-4) = 4
-2 (-4) = +8
(-3)(-4) = +12

4pts

6. Simplify each of the following using rules of exponents. Show your work to illustrate the rule used.

a. $4^7 \cdot 4^{-5} = 4^{7+(-5)} = 4^2$ or $4^7 \cdot \frac{1}{4^5} \rightarrow$

b. $\frac{6^5}{6^{-3}} = 6^{5-(-3)} = 6^8$

6pts

7. Show your steps to illustrate an easy way to divide these numbers; write your answer in scientific notation.

$$\frac{1.5\times10^{-5}}{3.0\times10^{-12}} = \frac{1.5}{3.0}\times 10^{-5-(-12)} = 0.5\times 10^{7} = 5.\times 10^{6}$$

9pts

8. Write each decimal as an equivalent fraction. Simplify, if possible.

a. 0.24 $= \frac{24}{100} = \frac{6}{25}$

b. 0.24242424... $\frac{24}{99} = \frac{8}{33}$

c. 0.524242424...

$100N = 52.4242424...$
$-\ 1N = \ .5242424...$
$99N = 51.9$
$N = \frac{51.9}{99} \cdot \frac{10}{10} = \frac{519}{990} = \frac{173}{330}$

12pts

9 a. **Explain** an easy method to **mentally calculate** 10 % of any number. Also give an example.

To find 10% of a #, you multiply by $\frac{1}{10}$, which means you ÷ by 10. So you move the decimal 1 place to the left. Ex: 10% of $48 = $4.80

b. **Explain** an easy method to **mentally calculate** 20 % of any number. Also give an example.

To find 20% you find 10% and double it. Ex 20% of 48 = 2(4.80) = 9.6

Or Find $\frac{1}{5}$ of # (since $\frac{20}{100} = \frac{2}{10} = \frac{1}{5}$) $\frac{1}{5}$ of 45 = 9

c. **Explain** an easy method to **mentally estimate** 68 % of any number. Also give an example.

To estimate 68% of a #, you could find 70% of # Ex. 70% of 60 = $\frac{7}{10}$ of 60 = 42

or $\frac{2}{3}$ of # Ex $\frac{2}{3}$ of 60 = 2(20) = 40

8pts

10a. Show an easy way to **estimate** this product using a fraction with a compatible number.

$0.34 \times 625 \approx \frac{1}{3}$ of $600 = 200$

or $\frac{1}{3}$ of $630 = 210$

b. **Calculate mentally** using the distributive property. (Show your thought process.)

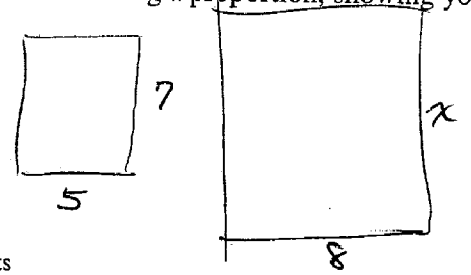
$8 \times \left(9\frac{3}{4}\right) = 8(9) + 8\left(\frac{3}{4}\right)$

$= 72 + 6$

$= 78$

6pts

11. A photograph measuring 5 inches by 7 inches is to be enlarged so that the smaller side, when enlarged, will be 8 inches. When enlarged, the longer side will be 11.2 inches. Solve using a proportion, showing your work.



$\frac{5}{7} = \frac{8}{x}$

$5x = 56$

$x = 11\frac{1}{5} = 11.2$ inches

9 pts

12.a. A school fund-raising project has collected $744, which is 62 % of its goal. What is the amount of the goal for for this project? 1200 Solve using a simple algebraic equation, showing your work.

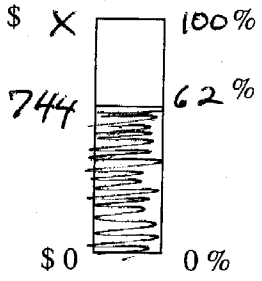
$744 = 62\% \text{ of } x$

$744 = .62x$

$\frac{744}{.62} = x$

$1200 = x$

b. Illustrate this problem by shading & putting appropriate numbers on this diagram.



10pts

13. a. State the theorem from section 7.1 that lets you decide whether a fraction will have a terminating decimal representation.

Simplify the fraction completely & then find the prime factors of the denominator. If the prime factors are only 2 and/or 5 then the decimal will terminate. (If there are any other factors the decimal will be infinite repeating)

b. Without dividing to convert the following fractions to decimals, state whether or not each would be a terminating decimal, then explain how to determine this using the theorem from part a.

$\frac{7}{560} = \frac{1}{80}$ terminating.

Explain: The prime factors of the simplified denominator are only 2 and 5.

80
8 · 10
2 · 2 · 2 · 2 · 5

24.5

$\frac{7}{42} = \frac{1}{6}$ not terminating.

Explain: The prime factor of 3 in the simplified denominator will make the decimal ∞ repeating.

6
2 · 3

$\overline{33}$