

# End of the Year Challenge Packet #1

Name: \_\_\_\_\_



Name \_\_\_\_\_

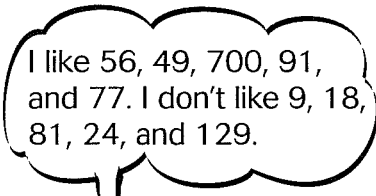
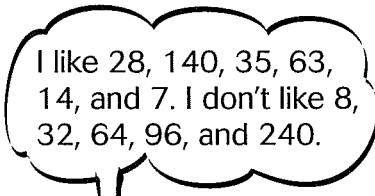
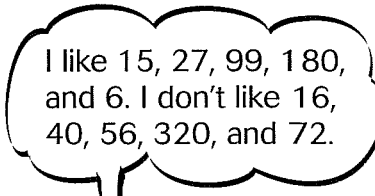

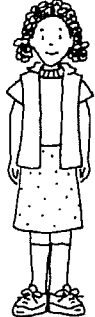

## A Number of Opinions

**E 7-1**

**REASONING**

Marsha, Jen, and Kozo are friends who have strong opinions about everything, including numbers. Read their opinions about numbers and then answer the questions.

Hint: Think about the rules of divisibility as you read the numbers.

 <p>I like 56, 49, 700, 91, and 77. I don't like 9, 18, 81, 24, and 129.</p>	 <p>I like 28, 140, 35, 63, 14, and 7. I don't like 8, 32, 64, 96, and 240.</p>	 <p>I like 15, 27, 99, 180, and 6. I don't like 16, 40, 56, 320, and 72.</p>
 Marsha	 Jen	 Kozo

1. Which two friends like the same kind of numbers? What kind of numbers do they like?  
\_\_\_\_\_
2. Which two friends dislike the same kind of numbers? What kind of numbers do they dislike?  
\_\_\_\_\_
3. Who likes the kind of numbers that Marsha dislikes? What kind of numbers are these?  
\_\_\_\_\_
4. Are there any numbers that all three friends like? Give an example.  
\_\_\_\_\_  
\_\_\_\_\_



Name \_\_\_\_\_

# Keeping Shop

**E** 4-5

**PROBLEM SOLVING**



Use Mental Math to solve each problem.

1. Bill's Building Supplies sells floor tiles. A box of floor tiles holds 20 tiles.  
Will 6 boxes of tiles be enough for Jamie to use 100 in her bathroom? \_\_\_\_\_
2. Bill needs to order 20,000 wing nuts. Wing nuts are sold 300 to the box.  
Will 60 boxes be enough? \_\_\_\_\_
3. Bill has a rack that has 40 hooks. If he wants to display 160 tools evenly  
on the rack, how many tools should he put on each hook? \_\_\_\_\_
4. Tyrone is having 500 keys made for his office. If keys cost \$2 each, how  
much will Tyrone pay? \_\_\_\_\_
5. Bill sells duct tape in packages of 2 rolls. Bill has 5 shelves with 6 packages  
on each shelf. How many rolls of duct tape does Bill have to sell? \_\_\_\_\_
6. Bill sells loose screws in boxes that weigh 15 pounds each.  
Two customers buy 40 boxes apiece. What is the total weight  
of the screws sold? \_\_\_\_\_
7. Last week, Bill ordered white paint. The full shipment arrived in 300  
boxes, and each box contained 9 cans. How many cans did he order? \_\_\_\_\_
8. Wire fencing comes in rolls of 50 feet. Frank buys 80 rolls.  
How many feet of wire fencing is he buying? \_\_\_\_\_



Name \_\_\_\_\_

## Chain Reaction

**E** 5-1

**NUMBER  
SENSE**

Use what you know about division and multiplication patterns to write each missing number and operation.

**1. Start** (400)  $\Rightarrow$    $\Rightarrow$  (80)  $\Rightarrow$    $\Rightarrow$  (40)  $\Rightarrow$    $\Rightarrow$  (1,600)

$\Rightarrow$  (200)  $\Rightarrow$    $\Rightarrow$  (1,400)  $\Rightarrow$    $\Rightarrow$  (700)  $\Rightarrow$    $\Rightarrow$  (2,100)

$\Rightarrow$  (300)  $\Rightarrow$    $\Rightarrow$  (2,700)  $\Rightarrow$    $\Rightarrow$  (300)  $\Rightarrow$    $\Rightarrow$  (50)

$\Rightarrow$  (250)  $\Rightarrow$    $\Rightarrow$  (500)  $\Rightarrow$    $\Rightarrow$  (100)  $\Rightarrow$    $\Rightarrow$  (400)

**2. Start** (900)  $\Rightarrow$    $\Rightarrow$  (3)  $\Rightarrow$    $\Rightarrow$  (60)  $\Rightarrow$    $\Rightarrow$  (300)

$\Rightarrow$  (100)  $\Rightarrow$    $\Rightarrow$  (25)  $\Rightarrow$    $\Rightarrow$  (50)  $\Rightarrow$    $\Rightarrow$  (1,000)

$\Rightarrow$  (9,000)  $\Rightarrow$    $\Rightarrow$  (900)  $\Rightarrow$    $\Rightarrow$  (300)  $\Rightarrow$    $\Rightarrow$  (100)

$\Rightarrow$  (3,000)  $\Rightarrow$    $\Rightarrow$  (30)  $\Rightarrow$    $\Rightarrow$  (5)  $\Rightarrow$    $\Rightarrow$  (15)



Name \_\_\_\_\_

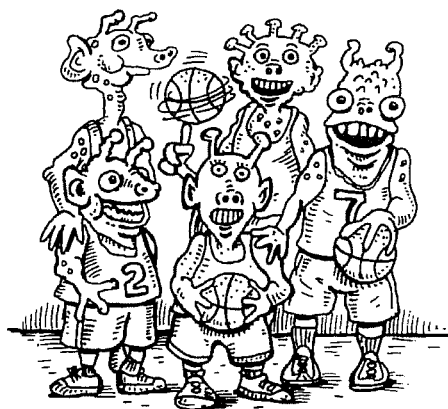
## Who's Average?

**E** 5-6

**REASONING**

Axim, Bazo, Calpa, Divon, and Elwid are members of an outer space All-Star Basketball Team. They each played 24 games last year. Read the data on each player.

- Axim's average is 5 points more than Bazo's.
- Bazo scored 1,896 points in 24 games.
- Calpa scored half as many points as Axim.
- Divon's average is 3 times Calpa's average.
- Elwid's average is half Divon's average.



Complete the chart. Find the total number of points each player scored in 24 games and the average number of points scored per game. Use a calculator if you wish.

Hint: Total number of points ÷ Number of games = Average

Number of games × Average = Total number of points

1. Which player's average must you find first? Why?

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Player	Total Points in 24 Games	Average Per Game
Axim		
Bazo		
Calpa		
Divon		
Elwid		

2. Who had the greatest average number of points per game? \_\_\_\_\_

3. What is the *range* of averages for the five players? \_\_\_\_\_

4. What is the total number of points scored by the five players in twenty-four games?

\_\_\_\_\_



Name \_\_\_\_\_

## Dividing in Bunches

**E** 7-13

**PROBLEM  
SOLVING**

1. A florist has 8,004 flowers to make identical arrangements in 200 vases. How many flowers are in each vase?  
\_\_\_\_\_
2. A florist has 400 flowers that must all be put into vases for display. Each vase can hold no more than 15 flowers. How many vases does the florist need?  
\_\_\_\_\_
3. A dozen roses costs \$33. How much does 1 rose cost?  
\_\_\_\_\_
4. The florist has a set of wind chimes in the store window. The second one is  $\frac{7}{8}$  the size of the first one. The third one is  $\frac{3}{4}$  that size, and the fourth one is  $\frac{5}{8}$  that size. By what fractions will the length of the chimes decrease for the next three chimes?  
\_\_\_\_\_
5. The florist is making an arrangement with 3 flowers. He can use roses, daisies, and carnations in any combination. He can even use three of the same kind of flower in an arrangement. How many different arrangements can he make? List them. (Hint: A rose, a daisy, and a carnation make up the same arrangement as a daisy, a rose, and a carnation.)  
\_\_\_\_\_  
\_\_\_\_\_
6. The florist has 2,010 long-stemmed roses. How many people can each buy 1 dozen roses? Will any roses be left?  
\_\_\_\_\_
7. The florist makes a pictograph to record sales of roses for one week. Each rose symbol on the graph will stand for 2 dozen roses. On Wednesday 228 roses were sold. How many symbols should be shown in the row for Wednesday on the graph?  
\_\_\_\_\_



Name \_\_\_\_\_

## Crack the Codes

**E** 2-3

**REASONING**

Find the digit that each symbol stands for.

1.  $23 + \clubsuit = 23$

$$\star + 3\clubsuit = 31$$

$$\star = \underline{\quad} \quad \clubsuit = \underline{\quad}$$

2.  $\blacktriangle\blacktriangledown - 13 = 70$

$$\blacktriangle = \underline{\quad} \quad \blacktriangledown = \underline{\quad}$$

3.  $\spadesuit\spadesuit + 1 = 100$

$$\spadesuit - \heartsuit = 2$$

$$\spadesuit = \underline{\quad} \quad \heartsuit = \underline{\quad}$$

4.  $\star - \diamond = 2$

$$\star + \diamond = 12$$

$$\star = \underline{\quad} \quad \diamond = \underline{\quad}$$

5.  $\star 5 - 20 = 15$

$$\blacklozenge 0 - \star 5 = 25$$

$$\star = \underline{\quad} \quad \blacklozenge = \underline{\quad}$$

6.  $1\oplus - \otimes = 13$

$$\oplus - 3 = \otimes$$

$$\oplus\oplus + \otimes\otimes = 143$$

$$\otimes = \underline{\quad} \quad \oplus = \underline{\quad}$$

7.  $\otimes\otimes - \otimes\otimes = 9$

$$\otimes - \otimes = 1$$

$$\otimes\otimes + \otimes\otimes = \otimes\otimes$$

$$\otimes = \underline{\quad} \quad \otimes = \underline{\quad}$$

8.  $2\star + 2\odot = 50$

$$\star 2 - \odot 2 = 40$$

$$\star = \underline{\quad} \quad \odot = \underline{\quad}$$

Use the space below to create a code. Give the code to a classmate to solve.

## Functions and Relationships

TEAM NO \_\_\_\_ TEAM  
MEMBERS:

1). (2 points) My grandfather's farm has pigs and chickens. I counted a total of 70 legs and 26 heads. How many chickens does my grandfather have?

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Answer: \_\_\_\_\_

2). (2 points) A certain shade of violet is created by mixing 3 gallons of red paint with 5 gallons of blue. How many gallons of red paint do you need to mix 40 gallons of this color?

Answer: \_\_\_\_\_

3). (2 points) A red light flashes every 2 minutes and a blue light flashes every 3.5 minutes. Suppose both lights flash together at noon. What is the first time after 1 p.m. that both lights will flash together?

Answer: \_\_\_\_\_

4). (2 points) Tom went to a store and spent one-third of his money. He went to a second store where he spent one-third of what remained. He had \$12 left. How much money did he have to begin with when he went to the first store?

Answer: \_\_\_\_\_

5). (2 points) Alice started a math club and recruited two new members the following week. The week after becoming a member, each new member recruits two new members. How many members are there at the end of five weeks?

Answer: \_\_\_\_\_





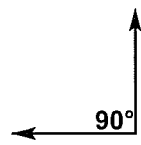
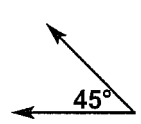
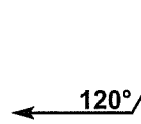
Name \_\_\_\_\_

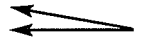
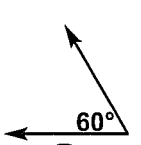
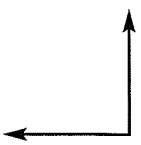
# Angle Tangle

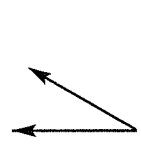
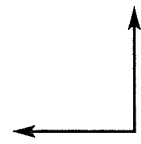
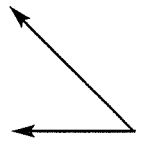
**E** 10-2

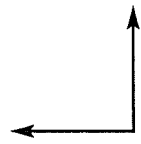
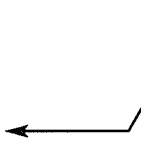
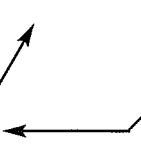
## REASONING

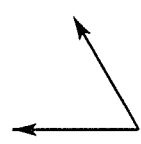
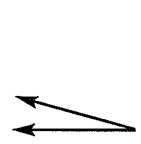

Complete the analogy on the left by circling the letter of the appropriate angle on the right. The first one is done for you. You may use a protractor.

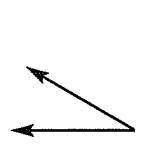
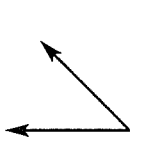
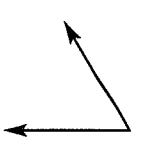
1.   $90^\circ$  is to   $45^\circ$  as   $120^\circ$  is to

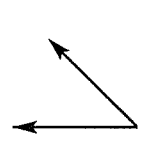
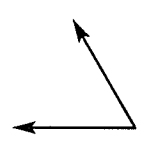
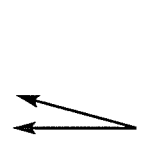
 **a**       **(b)**       **c**

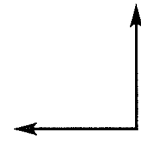
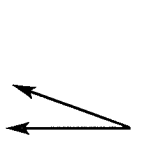
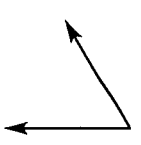
2.  is to  as  is to

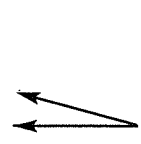
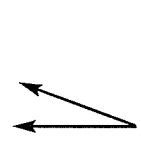
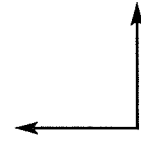
 **a**       **b**       **c**


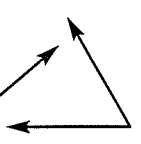
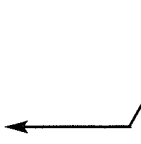
3.  is to  as  is to

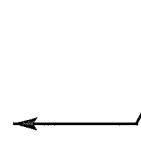
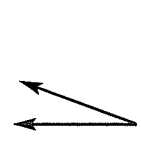
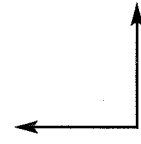
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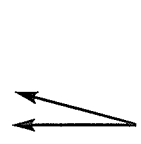
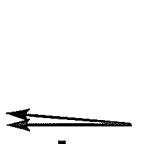
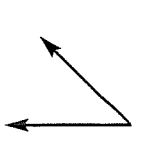
4.  is to  as  is to

 **a**       **b**       **c**

5.  is to  as  is to

 **a**       **b**       **c**

6.  is to  as  is to

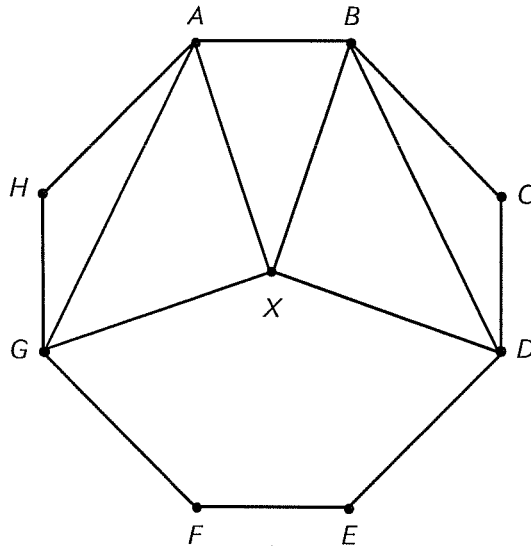
 **a**       **b**       **c**



Name \_\_\_\_\_

# Name That Shape!

**E 10-3**  
**REASONING**



Use the drawing above for Exercises 1–5.

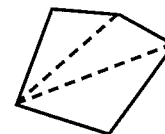
- Name the triangles. \_\_\_\_\_
- Name a pentagon. \_\_\_\_\_
- Name an octagon. \_\_\_\_\_
- Name 4 quadrilaterals. \_\_\_\_\_
- Connect points  $G$  and  $D$ . Name the shape of  $GDEF$ .

Name each polygon. Then find the number of sides and the number of triangles formed by the dotted lines.

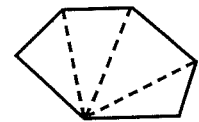
	Polygon	Sides	Triangles Formed
6.	a.		
7.	b.		
8.	c.		



a.



b.

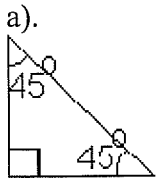


c.

- What pattern do you notice in the relationship of each polygon to the number of triangles formed?

\_\_\_\_\_

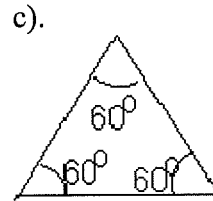
4). (2 points each) What type are these triangles?



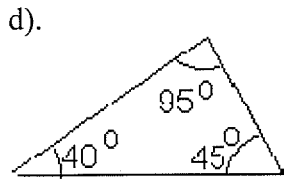
Type: \_\_\_\_\_



Type: \_\_\_\_\_



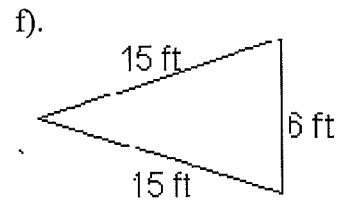
Type: \_\_\_\_\_



Type: \_\_\_\_\_

e). Find another name for the previous triangle.

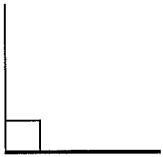
Other type: \_\_\_\_\_



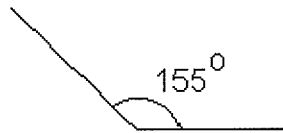
Type: \_\_\_\_\_

5). (2 points) If you add up all the angles in a triangle, they add up to \_\_\_\_\_ degrees.

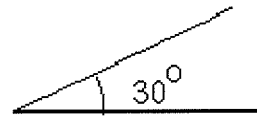
6). (2 points each) What type of angles are these?



Type: \_\_\_\_\_



Type: \_\_\_\_\_



Type: \_\_\_\_\_

7). (3 points)

Estimate the angle whose vertex is at Greely between the other two towns.

● Madison

● Tolton

● Grodloy

Angle = \_\_\_\_\_ °



Name \_\_\_\_\_

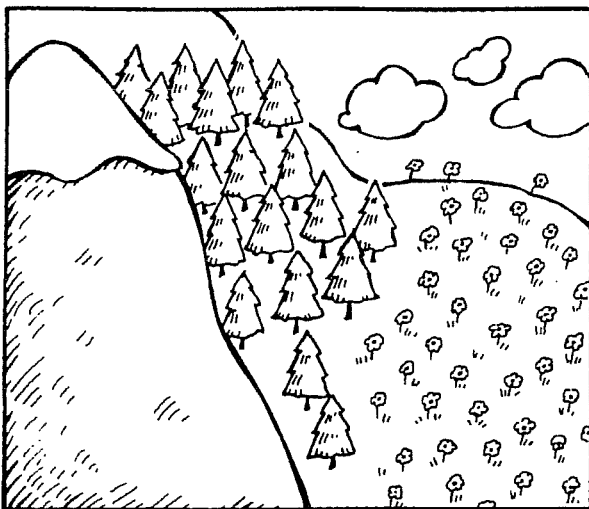
## Paint by Numbers

**E** 8-2

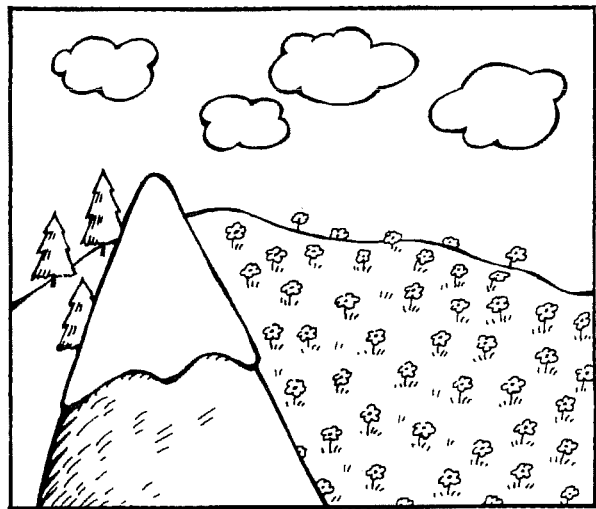
**NUMBER  
SENSE**

Tamara is painting a mountain scene. Use what you know about fractions to answer each question. Write each answer in simplest form. Drawings may help you.

1. The mountain's snow-covered peak takes up  $\frac{1}{18}$  of the painting. In all, the mountain takes up  $\frac{6}{18}$  of the painting. How much of the painting is taken up by the snowless part of the mountain? \_\_\_\_\_
2. Trees take up  $\frac{4}{18}$  of the painting, and a field of wildflowers takes up  $\frac{5}{18}$  of the painting. What portion of the painting do the trees and the field together take up? \_\_\_\_\_
3. The part of the painting that is not field, trees, or mountain shows the sky. What fraction of the painting shows the sky? \_\_\_\_\_
4. Which of the sketches below could show Tamara's painting? Circle the title of the correct picture.



Mountain Scene A



Mountain Scene B



Name \_\_\_\_\_

## Checking In

**E 8-6**

**ALGEBRA**

Add or subtract. Cross out the numbers used in the answer box. The fraction that is left answers the question.

$$1. \frac{6}{10} - \frac{\square}{\square} = \frac{1}{5}$$

$$2. \frac{1}{4} + \frac{\square}{\square} + \frac{3}{4} = 1\frac{3}{4}$$

$$3. \frac{5}{12} - \frac{\square}{\square} = \frac{1}{4}$$

$$4. \frac{\square}{\square} - \frac{3}{7} = \frac{2}{7}$$

$$5. \frac{7}{9} - \frac{\square}{\square} = \frac{4}{9}$$

$$6. \frac{\square}{\square} - \frac{1}{2} = \frac{1}{3}$$

7. At the beginning of a game of checkers, what fraction of the squares is covered by checkers? \_\_\_\_\_

$$8. \frac{7}{9} - \frac{\square}{\square} = \frac{5}{9}$$

$$9. \frac{7}{12} + \frac{1}{4} + \frac{\square}{\square} = 1\frac{1}{4}$$

$$10. \frac{\square}{\square} - \frac{1}{3} = \frac{1}{3}$$

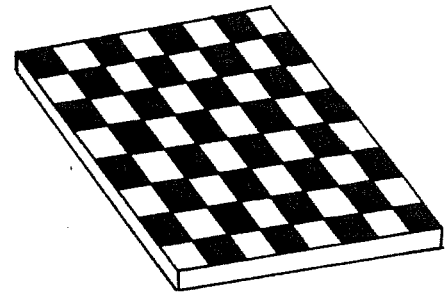
$$11. \frac{\square}{\square} - \frac{5}{8} = \frac{1}{8}$$

$$12. \frac{1}{8} + \frac{\square}{\square} = \frac{1}{2}$$

$$13. \frac{\square}{\square} - \frac{4}{7} = \frac{2}{7}$$

Answer Box for 1-6		
$\frac{1}{3}$	$\frac{2}{5}$	$\frac{1}{6}$
	$\frac{5}{7}$	$\frac{3}{8}$
$\frac{5}{6}$		$\frac{3}{4}$

Answer Box for 8-13		
$\frac{1}{4}$	$\frac{3}{4}$	$\frac{2}{3}$
	$\frac{2}{9}$	$\frac{3}{8}$
$\frac{5}{12}$	$\frac{6}{7}$	



14. In a game of chess, each player starts with 16 pieces. You have lost  $\frac{1}{2}$  of your pieces from the board. Your opponent has also lost half of her pieces. What fraction of the original pieces are left? \_\_\_\_\_

15. At the beginning of a game of chess, what fraction of the squares is covered by chess pieces? \_\_\_\_\_

## Year 2 Lesson 4 Homework

Name \_\_\_\_\_

1). Simplify these fractions without using your calculator:

a).  $\frac{6}{10} =$

\_\_\_\_\_

b).  $\frac{5}{20} =$

\_\_\_\_\_

c).  $\frac{2}{50} =$

\_\_\_\_\_

d).  $\frac{28}{32} =$

\_\_\_\_\_

e).  $\frac{24}{30} =$

\_\_\_\_\_

f).  $\frac{33}{77} =$

\_\_\_\_\_

2). Multiply (no calculators):

a).  $\frac{1}{7} \cdot \frac{1}{3} =$

\_\_\_\_\_

b).  $\frac{2}{3} \cdot \frac{4}{5} =$

\_\_\_\_\_

c).  $\frac{3}{7} \cdot \frac{2}{7} =$

\_\_\_\_\_

d).  $\frac{9}{11} \cdot \frac{2}{10} =$

\_\_\_\_\_

e).  $6 \cdot \frac{1}{7} =$

\_\_\_\_\_

f).  $3 \cdot \frac{2}{11} =$

\_\_\_\_\_

3). Cancel, multiply, simplify (no calculator):

a).  $\frac{2}{3} \cdot \frac{3}{5} =$

\_\_\_\_\_

b).  $\frac{1}{2} \cdot \frac{2}{3} \cdot \frac{3}{4} =$

\_\_\_\_\_

c).  $\frac{1}{5} \cdot \frac{2}{3} \cdot \frac{3}{4} \cdot \frac{4}{2} =$

\_\_\_\_\_

d).  $\frac{5}{6} \cdot \frac{3}{10} \cdot \frac{2}{4} \cdot \frac{1}{3} =$

\_\_\_\_\_

e).  $5 \cdot \frac{1}{5} \cdot 2 \cdot \frac{1}{2} =$

\_\_\_\_\_