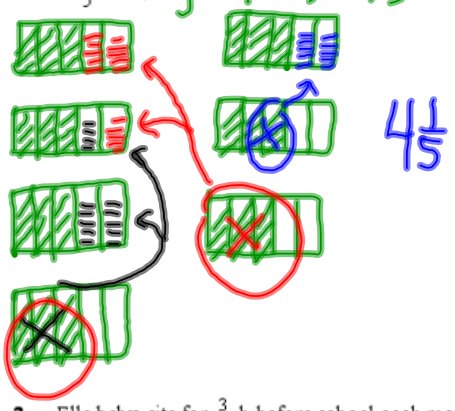
Grade 8 Name _____ Class _____

Unit 3 Final Exam Review

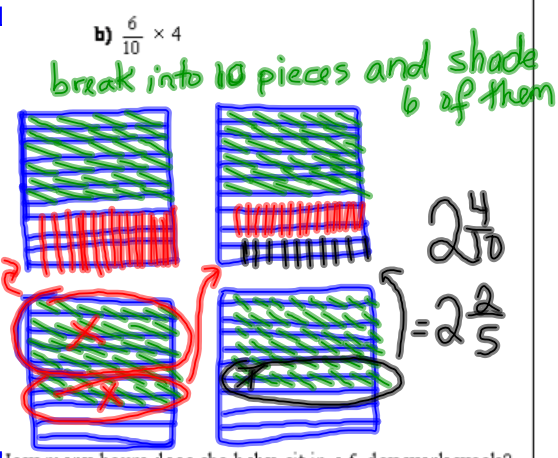
1. Multiply. Draw a picture to show each answer.

a) $7 \times \frac{3}{5}$ 7 groups of 3/5



$4\frac{1}{5}$

b) $\frac{6}{10} \times 4$ break into 10 pieces and shade 6 of them



$2\frac{4}{10} = 2\frac{2}{5}$

2. Ella baby-sits for $\frac{3}{4}$ h before school each morning. How many hours does she baby-sit in a 5-day work week?

$$\frac{5}{1} \times \frac{3}{4} = \frac{15}{4} = 3\frac{3}{4}\text{ h}$$

3. Ian's monthly allowance is $21. In January he starts saving for a birthday gift in June. Each month he saves $\frac{2}{3}$ of his allowance. The gift he wants to buy costs $110. Will Ian have enough money? Explain.

$\frac{2}{3} \times \$21^{7} = \frac{14}{1} = \$14$ He saves $14 each month.

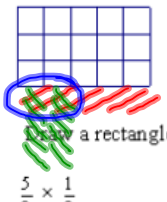
There are 6 months from January to June.

So $6 \times \$14 = \$84$.

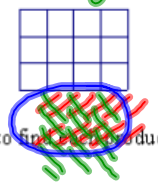
He will not have enough money. He will need $110 - 84 = \$26$ more.

4. Use the rectangle to find each product.

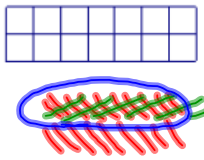
a) $\frac{1}{3} \times \frac{2}{5}$ **b)** $\frac{3}{5} \times \frac{3}{4}$ **c)** $\frac{1}{7} \times \frac{1}{2}$



$\frac{2}{15}$



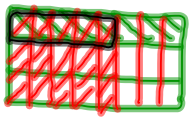
$\frac{6}{12} = \frac{1}{2}$



$\frac{5}{14}$

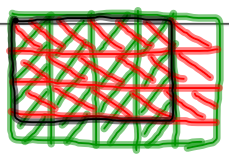
5. Draw a rectangle on grid paper to find each product.

a) $\frac{5}{8} \times \frac{1}{3}$



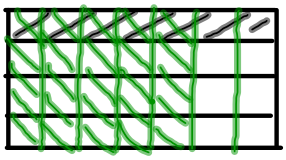
$\frac{5}{24}$

b) $\frac{3}{4} \times \frac{4}{5}$



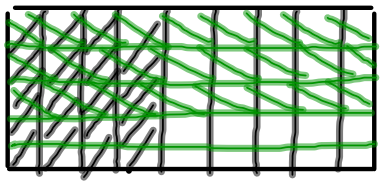
$\frac{12 \div 4}{20 \div 4} = \frac{3}{5}$

c) $\frac{5}{7} \times \frac{1}{4}$



$\frac{5}{28}$

d) $\frac{3}{5} \times \frac{4}{9}$



$\frac{12}{45} \div 3 = \frac{4}{15}$ $\div 3$

6. One-third of the students in Mrs. Elm's class walk to school. Of the students who do not walk, four-fifths take the bus. What fraction of the students in Mrs. Elm's class take the bus to school?

$\frac{1}{3}$ walk, so $\frac{2}{3}$ do not walk.

$\frac{4}{5}$ of $\frac{2}{3} = \frac{4}{5} \times \frac{2}{3} = \frac{8}{15}$ take the bus

7. Multiply. Estimate to check.

a) $\frac{2}{3} \times \frac{6}{9} = \frac{12}{27} \div 3 = \frac{4}{9}$

or $\frac{2}{3} \times \frac{6}{9} = \frac{4}{9}$

b) $\frac{10}{3} \times \frac{6}{8} = \frac{60}{24} \div 12 = \frac{5}{2} = 2\frac{1}{2}$

or $\frac{10}{3} \times \frac{6}{8} = \frac{5}{2} = 2\frac{1}{2}$

c) $\frac{5}{2} \times \frac{1}{4} = \frac{5}{8}$

d) $\frac{7}{3} \times \frac{5}{3} = \frac{35}{9} = 3\frac{8}{9}$

e) $\frac{9}{10} \times \frac{5}{18} = \frac{45}{180} \div 45 = \frac{1}{4}$

or $\frac{9}{10} \times \frac{5}{18} = \frac{1}{4}$

8. Write the mixed number and improper fraction represented by each picture.

a)

$2\frac{3}{6}$

$\frac{15}{6}$

b)

$2\frac{7}{10}$

$\frac{27}{10}$

9. Multiply.

a) $2\frac{3}{5} \times 1\frac{1}{2}$

$\frac{13}{5} \times \frac{3}{2}$

$\frac{39}{10} = 3\frac{9}{10}$

b) $4\frac{6}{8} \times 3\frac{2}{3}$

$\frac{38}{8} \times \frac{11}{3}$

$\frac{209}{12} = 17\frac{5}{12}$

c) $5\frac{1}{6} \times 2\frac{3}{4}$

$\frac{31}{6} \times \frac{11}{4}$

$\frac{341}{24} = 14\frac{5}{24}$

d) $\frac{5}{8} \times 3\frac{4}{5}$

$\frac{5}{8} \times \frac{19}{5}$

$\frac{19}{8} = 2\frac{3}{8}$

10. Amber made $5\frac{3}{4}$ pitchers of iced tea for her friends. They drank $\frac{2}{3}$ of the iced tea. How many pitchers of iced tea did they drink?

$\frac{2}{3}$ of $5\frac{3}{4}$

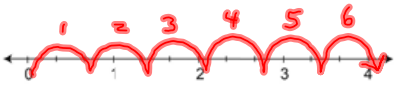
$\frac{2}{3} \times \frac{23}{4} = \frac{23}{6} = 3\frac{5}{6}$ pitchers

11. Use a number line to find each quotient.

a) $4 \div \frac{2}{3}$

$= 6$

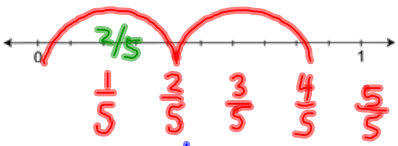
How many $\frac{2}{3}$s in 4?



b) $\frac{4}{5} \div 2$

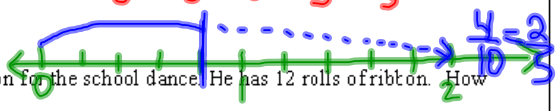
$= \frac{2}{5}$

Break $\frac{4}{5}$s into 2 pieces



or

How many 2s in $\frac{4}{5}$?



12. Samuel uses $\frac{2}{3}$ roll of ribbon to tie one balloon for the school dance. He has 12 rolls of ribbon. How many balloons can he tie?

$12 \div \frac{2}{3}$

$\frac{12}{1} \times \frac{3}{2} = \frac{18}{1} = 18$

He can tie 18 balloons

13. Write the reciprocal of each.

a) $5\frac{1}{3}$ $= \frac{16}{3}$ reciprocal → $\frac{3}{16}$

b) $\frac{8}{7}$ $\frac{7}{8}$

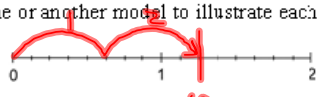
14. Write each mixed number as an improper fraction.

a) $2\frac{2}{7}$ $\frac{16}{7}$

b) $3\frac{5}{8}$ $\frac{29}{8}$

15. Use a copy of each number line or another model to illustrate each quotient.

a) $\frac{10}{8} \div \frac{5}{8} = 2$



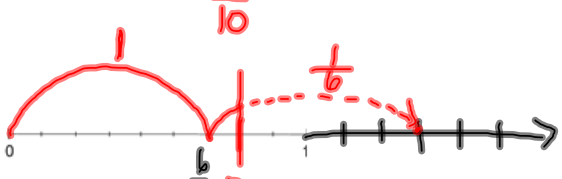
$\frac{10}{8}$

b) $\frac{12}{10} \div \frac{1}{5} = 6$

$\frac{12}{10}$

c) $\frac{7}{9} \div \frac{2}{3} = 1\frac{1}{6}$

$\frac{6}{9}$



16. Find each quotient.

a) $\frac{7}{5} \div \frac{1}{3}$ $\frac{7}{5} \times \frac{3}{1} = \frac{21}{5} = 4\frac{1}{5}$

b) $\frac{4}{10} \div \frac{5}{7}$ $\frac{\cancel{4}^{2}}{\cancel{10}_{5}} \times \frac{7}{5} = \frac{14}{25}$

c) $3\frac{1}{5} \div 2\frac{3}{4}$ $\frac{16}{5} \div \frac{11}{4} = \frac{16}{5} \times \frac{4}{11} = \frac{64}{55} = 1\frac{9}{55}$

d) $2\frac{2}{3} \div 1\frac{1}{4}$ $\frac{8}{3} \div \frac{5}{4} = \frac{8}{3} \times \frac{4}{5} = \frac{32}{15} = 2\frac{2}{15}$

17. Calculate

a) $2\frac{3}{4} \div \frac{1}{3}$

$\frac{11}{4} \times \frac{3}{1}$

$\frac{33}{4} = 8\frac{1}{4}$

b) $2\frac{3}{4} + \frac{1}{3}$

$2\frac{9}{12} + \frac{4}{12}$

$2\frac{13}{12} = 3\frac{1}{12}$

c) $2\frac{3}{4} \times \frac{1}{3}$

$\frac{11}{4} \times \frac{1}{3} = \frac{11}{12}$

d) $2\frac{3}{4} - \frac{1}{3}$

$2\frac{9}{12} - \frac{4}{12}$

$2\frac{5}{12}$

18. Evaluate. Show all steps.

a) $\frac{2}{5} \times (\frac{1}{4} + \frac{2}{3}) - \frac{3}{10}$

$\frac{2}{5} \times (\frac{3}{12} + \frac{8}{12}) - \frac{3}{10}$

$\frac{2}{5} \times \frac{11}{12} - \frac{3}{10}$

$\frac{11}{30} - \frac{9}{30} = \frac{2}{30} = \frac{1}{15}$

b) $\frac{7}{9} - (\frac{1}{3} + \frac{5}{6}) \div 3$

$\frac{7}{9} - (\frac{4}{12} + \frac{10}{12}) \div 3$

$\frac{7}{9} - \frac{14}{12} \div \frac{3}{1}$

$\frac{7}{9} - \frac{14}{12} \times \frac{1}{3}$

$\frac{14}{18} - \frac{7}{18} = \frac{7}{18}$

c) $1 \div \frac{2}{3} \quad 3\frac{1}{4} + \frac{7}{12}$

$\frac{4}{1} \times \frac{3}{2} - 3\frac{1}{4} + \frac{7}{12}$

$\frac{12}{2} - 3\frac{1}{4} + \frac{7}{12}$

$\frac{24}{4} - \frac{13}{4} + \frac{7}{12}$

$\frac{11}{4} + \frac{7}{12}$

$\frac{33}{12} + \frac{7}{12} \quad \frac{40}{12} = \frac{10}{3} = 3\frac{1}{3}$

19. A dressmaker needs $3\frac{3}{8}$ m of fabric to sew one dress.
How many dresses can the dressmaker make with 28 m of fabric?

$28 \div 3\frac{3}{8}$

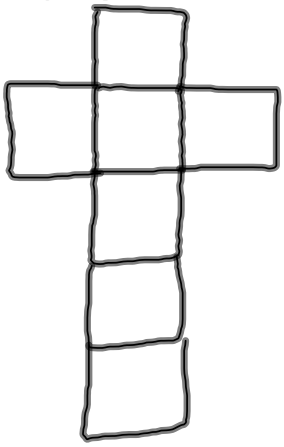
$\frac{28}{1} \div \frac{27}{8}$

$\frac{28}{1} \times \frac{8}{27} = \frac{224}{27} = 8\frac{8}{27}$ 8 dresses

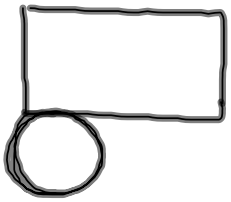
Unit 4 Final Exam Review

1. Draw a net for each of the following objects.

a) A square room



b) A cylinder that has no top



2. Tracy made a stained-glass jewellery box. It measured 20 cm by 12 cm by 8 cm.

a) About how much glass did Tracy use?

Top = $20 \times 12 = 240\ cm^2$
Bottom = $240\ cm^2$
Side 1 = $12 \times 8 = 96\ cm^2$
Side 2 = $96\ cm^2$
Front = $20 \times 8 = 160\ cm^2$
Back = $160\ cm^2$

Total = $992\ cm^2$

b) One piece of glass has an area of 100 cm^2 and costs $3.65. How much did the glass cost?

$992 \div 100 = 9.92$ or 10 pieces of glass

$\$3.65 \times 10 = \$36.50$

assuming no wastage

3. The surface area of a cube is 150 cm^2.

a) What is the area of one face of the cube?

6 identical sides

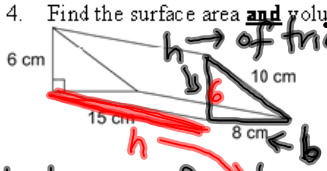
$\frac{150}{6} = 25\ cm^2$

b) What is the length of one edge of the cube?

$s = \sqrt{25}$

$= 5\ cm^2$

4. Find the surface area **and** volume of the figures.



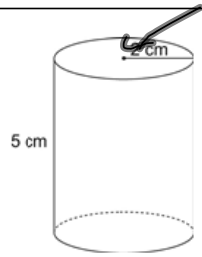
h → of triangle

Volume = A · h

$A = \frac{1}{2}bh$

$= \frac{1}{2} \times 8 \times 6 = 24 cm^2$

$V = 24 \times 15 = 360 cm^3$



$A = \pi r^2$

$3.14 \times 2 \times 2$

$= 12.56 cm^2$

$V = A \times h$

$= 12.56 \times 5$

$= 62.8 cm^3$

S.A

2 triangles : $\frac{1}{2}bh$

$\frac{1}{2} \times 8 \times 6 = 24 cm^2$ and $24 cm^2$

3 rectangles : $15 \times 6 = 90 cm^2$

$15 \times 8 = 120 cm^2$

$15 \times 10 = 150 cm^2$

S.A = 24 + 24 + 90 + 120 + 150 = 408 cm^2

S.A.

2 circles $\Rightarrow \pi r^2 = 12.56 cm^2$ $12.56 cm^2$

Centre = $C \times h$

$= \pi \times d \times h$

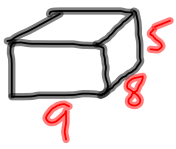
$= 3.14 \times 4 \times 5$

$= 62.8 cm^2$

SA = 12.56 + 12.56 + 62.8

$= 87.9 cm^2$

5. Find the volume of a rectangular prism having dimensions 8 m by 9 m.



$V = A \times h$

$= (9 \times 8) \times 5$

$= 72 \times 5$

$= 360 m^3$

6. A cylindrical candle has diameter 9 cm and height 12 cm. It is placed in a cylindrical box. There is a space of 0.5 cm between the candle and the box to allow for packing material.

a) What is the height of the cylindrical box?

bottom top

Box height 12 + 0.5 + 0.5

13cm

b) What is the radius of the cylindrical box?

$r = 9 + 0.5 + 0.5 = 10 cm$

each side

c) What is the surface area of the box?

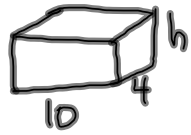
S.A → Top = $\pi r^2 = 3.14 \times 5 \times 5 = 78.5$

Bottom = 78.5

C.A = $C \times h = \pi \times d \times h$

7. Bob's backyard pool is in the shape of a rectangular prism. The pool is 4 m wide and 10 m long. It holds 60 m^3 of water.

a) What is the depth of the water?



$V = A \times h$

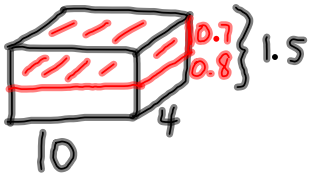
$60 = 10 \times 4 \times h$

$\frac{60}{40} = \frac{40h}{40}$

$1.5 = h$

depth is 1.5m

b) Bob has to decrease the depth of water by 0.7 m for the winter. How much water does he take out?



$10 \times 4 \times 0.7$

$28 m^3$

Since $1 m^3 = 1000 L$

$28 \times 1000 = 28\,000 L$ must be removed.