Exercise 13

Multiplying with Canceling

You can **cancel** out common factors before multiplying fractions. Cancel by dividing any numerator and denominator by a number that goes evenly into both.

Multiply. $\frac{1}{3} \times \frac{6}{7} \times \frac{1}{4}$

Divide 3 and 6 by 3.
Divide 2 and 4 by 2.

$$\frac{1}{\cancel{3}_{1}} \times \frac{\overset{1}{\cancel{6}_{2}}}{7} \times \frac{1}{\cancel{4}_{2}}$$

Multiply the numerators.
Multiply the denominators.

$$\frac{1}{\cancel{3}_{1}} \times \frac{\overset{1}{\cancel{6}_{2}}}{7} \times \frac{1}{\cancel{4}_{2}} = \frac{1}{14}$$

Multiply.

1. $\frac{3}{4} \times \frac{5}{6} =$

2. $\frac{7}{8} \times \frac{16}{20} =$

3. $\frac{1}{3} \times \frac{6}{9} =$

4. $\frac{5}{12} \times \frac{5}{10} =$

5. $\frac{2}{3} \times \frac{6}{8} =$

6. $\frac{9}{10} \times \frac{5}{18} =$

7. $\frac{4}{10} \times \frac{5}{6} =$

8. $\frac{7}{10} \times \frac{6}{28} =$

9. $\frac{1}{8} \times \frac{4}{6} =$

10. $\frac{7}{16} \times \frac{8}{14} =$

11. $\frac{2}{3} \times \frac{8}{4} =$

12. $\frac{1}{2} \times \frac{3}{9} \times \frac{4}{12} =$

13. $\frac{8}{10} \times \frac{5}{6} \times \frac{4}{5} =$

14. $\frac{6}{7} \times \frac{6}{12} \times \frac{6}{8} =$

15. $\frac{3}{9} \times \frac{9}{12} \times \frac{1}{4} =$

16. $\frac{3}{8} \times \frac{4}{6} \times \frac{12}{18} =$

17. $\frac{1}{2} \times \frac{3}{4} \times \frac{8}{12} =$

18. $\frac{12}{18} \times \frac{3}{4} \times \frac{1}{3} =$

19. $\frac{4}{5} \times \frac{10}{18} \times \frac{4}{8} =$

20. $\frac{7}{8} \times \frac{24}{35} \times \frac{6}{7} =$

21. $\frac{2}{3} \times \frac{3}{4} \times \frac{12}{48} =$

Solve.

22. Joe wants to make multiplying $\frac{2}{3} \times \frac{5}{6} \times \frac{10}{12}$ easier. Therefore, he first needs to cancel out common factors in the fractions. Show how Joe should cancel before multiplying.

$$\frac{2}{3} \times \frac{5}{6} \times \frac{10}{12}$$

Directions: Choose the one best answer to each item. Circle the number of the correct answer.

23. Steven puts $\frac{3}{8}$ of his earnings into savings. He plans to use $\frac{1}{6}$ of his savings to fix up his car. What fraction of his earnings will he spend on his car?

(1) $\frac{1}{48}$
(2) $\frac{1}{16}$
(3) $\frac{3}{16}$
(4) $\frac{1}{4}$
(5) $\frac{3}{4}$

24. Terri has $\frac{3}{4}$ cup of flour to make bread. She needs to save $\frac{1}{6}$ of that flour for kneading. How much flour will Terri put aside? (Answer is in lowest terms.)

(1) $\frac{3}{24}$ cup
(2) $\frac{1}{2}$ cup
(3) $\frac{1}{4}$ cup
(4) $\frac{1}{6}$ cup
(5) $\frac{1}{8}$ cup

25. At a company, $\frac{5}{12}$ of the employees would like the company to pay for dental insurance. Of those, $\frac{2}{5}$ would also like the company to pay for dental insurance for their families. What fraction of the employees would like the company to pay for both benefits?

(1) $\frac{1}{12}$
(2) $\frac{3}{5}$
(3) $\frac{1}{10}$
(4) $\frac{1}{5}$
(5) $\frac{1}{6}$

26. Kathy is learning to cancel fractions. She has to multiply $\frac{3}{6}$, $\frac{4}{12}$, and $\frac{1}{2}$. Which answer shows a correct way to cancel completely?

(1) $\frac{\overset{1}{\cancel{3}}}{\underset{3}{\cancel{6}}} \times \frac{4}{12} \times \frac{1}{2}$

(2) $\frac{\overset{1}{\cancel{3}}}{\underset{3}{\cancel{6}}} \times \frac{\overset{2}{\cancel{4}}}{\underset{4}{\cancel{12}}} \times \frac{1}{2}$

(3) $\frac{\overset{1}{\cancel{3}}}{\underset{}{6}} \times \frac{\overset{2}{\cancel{4}}}{\underset{4}{\cancel{12}}} \times \frac{1}{\underset{1}{\cancel{2}}}$

(4) $\frac{\overset{1}{\cancel{3}}}{\underset{3}{\cancel{6}}} \times \frac{\overset{1}{\cancel{2}}}{\underset{4}{\cancel{12}}} \times \frac{1}{\underset{1}{\cancel{2}}}$

(5) $\frac{\overset{1}{\cancel{3}}}{\underset{3}{\cancel{6}}} \times \frac{\overset{2}{\cancel{4}}}{\underset{2}{\cancel{12}}} \times \frac{1}{\underset{1}{\cancel{2}}}$

27. In item 26, what is the answer to Kathy's problem?

(1) $\frac{1}{2}$
(2) $\frac{1}{6}$
(3) $\frac{1}{8}$
(4) $\frac{1}{12}$
(5) $\frac{1}{16}$

28. John has a recipe that calls for $\frac{4}{8}$ cup of sugar. He wants to make $\frac{1}{3}$ of the recipe. How much sugar should John measure?

(1) $\frac{1}{6}$ cup
(2) $\frac{2}{10}$ cup
(3) $\frac{5}{16}$ cup
(4) $\frac{4}{8}$ cup
(5) none of the above