# Division by 6

Notice that all the multiples of six are even numbers. Notice also that when you add the digits of the multiples, they add up to three or a multiple of three. In $6 \times 7 = 42$, 42 is an even number and $4 + 2 = 6$, which is a multiple of three. Carefully observe the student's progress and move to the next lesson only when you are satisfied with his or her mastery.

Example 1

$$6 \uparrow 24 \xrightarrow{?} \qquad \frac{24}{6} = 24 \div 6 =$$
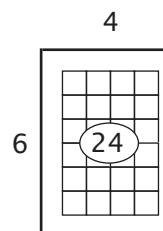
"What times six is equal to 24?"
"Six times what is equal to 24?"
"How many sixes can I count out of 24?"
"24 divided by six equals what number?"

Example 2

$$4 \uparrow 24 \xrightarrow{?} \qquad \frac{24}{4} = 24 \div 4 =$$
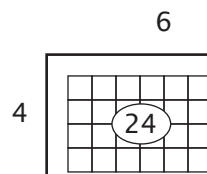
"What times four is equal to 24?"
"Four times what is equal to 24?"
"How many fours can I count out of 24?"
"24 divided by four equals what number?"

1 ÷ 1	2 ÷ 2	3 ÷ 3	4 ÷ 4	5 ÷ 5	6 ÷ 6	7 ÷ 7	8 ÷ 8	9 ÷ 9	10 ÷ 10
2 ÷ 1	4 ÷ 2	6 ÷ 3	8 ÷ 4	10 ÷ 5	12 ÷ 6	14 ÷ 7	16 ÷ 8	18 ÷ 9	20 ÷ 10
3 ÷ 1	6 ÷ 2	9 ÷ 3	12 ÷ 4	15 ÷ 5	18 ÷ 6	21 ÷ 7	24 ÷ 8	27 ÷ 9	30 ÷ 10
4 ÷ 1	8 ÷ 2	12 ÷ 3	16 ÷ 4	20 ÷ 5	24 ÷ 6	28 ÷ 7	32 ÷ 8	36 ÷ 9	40 ÷ 10
5 ÷ 1	10 ÷ 2	15 ÷ 3	20 ÷ 4	25 ÷ 5	30 ÷ 6	35 ÷ 7	40 ÷ 8	45 ÷ 9	50 ÷ 10
6 ÷ 1	12 ÷ 2	18 ÷ 3	24 ÷ 4	30 ÷ 5	36 ÷ 6	42 ÷ 7	48 ÷ 8	54 ÷ 9	60 ÷ 10
7 ÷ 1	14 ÷ 2	21 ÷ 3	28 ÷ 4	35 ÷ 5	42 ÷ 6	49 ÷ 7	56 ÷ 8	63 ÷ 9	70 ÷ 10
8 ÷ 1	16 ÷ 2	24 ÷ 3	32 ÷ 4	40 ÷ 5	48 ÷ 6	56 ÷ 7	64 ÷ 8	72 ÷ 9	80 ÷ 10
9 ÷ 1	18 ÷ 2	27 ÷ 3	36 ÷ 4	45 ÷ 5	54 ÷ 6	63 ÷ 7	72 ÷ 8	81 ÷ 9	90 ÷ 10
10 ÷ 1	20 ÷ 2	30 ÷ 3	40 ÷ 4	50 ÷ 5	60 ÷ 6	70 ÷ 7	80 ÷ 8	90 ÷ 9	100 ÷ 10

LESSON PRACTICE

Answer the questions.

1. How many sixes can you count out of eighteen? _____

2. How many sixes can you count out of fifty-four? _____

3. How many sixes can you count out of twelve? _____

4. How many sixes can you count out of sixty? _____

Divide.

5. $6 \overline{)12}$

6. $6 \overline{)6}$

7. $6 \overline{)24}$

8. $6 \overline{)36}$

9. $6 \overline{)42}$

10. $6 \overline{)18}$

11. $60 \div 6 =$ _____

12. $24 \div 6 =$ _____

13. $42 \div 6 =$ _____

14. $\dfrac{54}{6} =$ _____

15. $\dfrac{30}{6} =$ _____

Fill in the unknown number to make the division problem true.

16. $48 \div$ _____ $= 8$

17. How many ants are present if there are 24 legs? (Ants have six legs apiece.) _____

18. How much must Dana earn every day in order to earn $30 in six days? _____

LESSON PRACTICE

Answer the questions.

1. How many sixes can you count out of thirty? _____

2. How many sixes can you count out of six? _____

3. How many sixes can you count out of twenty-four? _____

4. How many sixes can you count out of forty-eight? _____

Divide.

5. 6$\overline{)36}$ 6. 6$\overline{)60}$

7. 6$\overline{)30}$ 8. 6$\overline{)18}$

9. 6$\overline{)54}$ 10. 6$\overline{)42}$

11. $6 \div 6 =$ _____

12. $24 \div 6 =$ _____

13. $18 \div 6 =$ _____

14. $\dfrac{30}{6} =$ _____

15. $\dfrac{48}{6} =$ _____

Fill in the unknown number to make the division problem true.

16. $12 \div$ _____ $= 2$

17. If it took Marie six minutes to play a song on her harp, how many songs could she play in one hour? (1 hour = 60 minutes) _____

18. Roger earned $54 in six hours. How much did he earn each hour? _____

LESSON PRACTICE

Answer the questions.

1. How many sixes can you count out of fifty-four? _____

2. How many sixes can you count out of thirty-six? _____

3. How many sixes can you count out of sixty? _____

4. How many sixes can you count out of forty-two? _____

Divide.

5. $6\overline{)1\ 8}$ 6. $6\overline{)5\ 4}$

7. $6\overline{)6}$ 8. $6\overline{)3\ 0}$

9. $6\overline{)1\ 2}$ 10. $6\overline{)2\ 4}$

11. $42 \div 6 =$ _____

12. $36 \div 6 =$ _____

13. $48 \div 6 =$ _____

14. $\dfrac{60}{6} =$ _____

15. $\dfrac{54}{6} =$ _____

16. $\dfrac{12}{6} =$ _____

17. Shane has $48 to spend on Christmas gifts for six of his friends. How much will he be able to spend on each friend? _____

18. A carpenter has a board that is 18 feet long. If he saws it into six equal lengths, how many feet long will each piece be? _____

How many yards long is each piece? _____

8D

Divide.

1. $6\overline{)18}$

2. $6\overline{)42}$

3. $6\overline{)54}$

4. $3\overline{)24}$

5. $5\overline{)25}$

6. $2\overline{)18}$

7. $9\overline{)54}$

8. $10\overline{)60}$

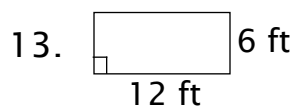9. $48 \div 6 =$ _____

10. $72 \div 9 =$ _____

11. $\dfrac{21}{3} =$ _____

12. $\dfrac{35}{5} =$ _____

Find the area.

13. ☐ 6 ft
   12 ft

14. 7"
   3"

15. ☐ 4 in
   4 in

A = _____   A = _____   A = _____
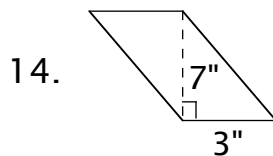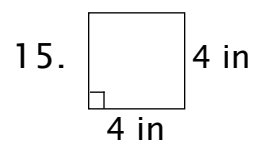
QUICK REVIEW

Place-value notation can be used to check your work when multiplying. Be sure to place each "carry" in the proper column. Study the example.

Example 1

$$
\begin{array}{r}
1\ 4 \\
\times\ 1\ 7 \\
\hline
②\ \\
7\ 8 \\
①\ \\
1\ 4 \\
\hline
2\ 3\ 8
\end{array}
\qquad
\begin{array}{r}
10 + 4 \\
\times \quad 10 + 7 \\
\hline
(20) \\
70 + 8 \\
(100) \\
100 + 40 + \\
\hline
200 + 30 + 8
\end{array}
$$

Multiply. Check your work with place-value notation.

16.
$$
\begin{array}{r}
2\ 3 \\
\times\ 3\ 6 \\
\hline
\end{array}
$$

17.
$$
\begin{array}{r}
7\ 8 \\
\times\ 3\ 4 \\
\hline
\end{array}
$$

18.
$$
\begin{array}{r}
6\ 5 \\
\times\ 1\ 5 \\
\hline
\end{array}
$$

19. Each of the 12 white mice had 15 babies. How many baby mice is that? _____

20. The area of a rectangle is 45 square feet, and the area of a parallelogram is 61 square feet. What is the difference between their areas? _____

21. Sophie bought 36 skeins of yarn. If she uses six skeins for each afghan, how many afghans can she make? _____

22. Kevin earned $39 yesterday and $28 today. How much did he earn in all? _____

Divide.

1. $6 \overline{)12}$

2. $6 \overline{)60}$

3. $6 \overline{)42}$

4. $6 \overline{)24}$

5. $9 \overline{)27}$

6. $5 \overline{)40}$

7. $10 \overline{)20}$

8. $3 \overline{)12}$

9. $15 \div 3 =$ _____

10. $30 \div 6 =$ _____

11. $\dfrac{6}{6} =$ _____

12. $\dfrac{12}{2} =$ _____

Add or subtract.

13.
$$\begin{array}{r} 1\,3 \\ +\,1\,9 \\ \hline \end{array}$$

14.
$$\begin{array}{r} 2\,8 \\ +\,4\,9 \\ \hline \end{array}$$

15.
$$\begin{array}{r} 7\,2 \\ -\,2\,6 \\ \hline \end{array}$$

16.
$$\begin{array}{r} 4\,7 \\ -\,3\,8 \\ \hline \end{array}$$

Multiply. Check your work with place-value notation.

17.
$$\begin{array}{r} 4\,5 \\ \times\,2\,2 \\ \hline \end{array}$$

18.
$$\begin{array}{r} 1\,6 \\ \times\,1\,4 \\ \hline \end{array}$$

19.
$$\begin{array}{r} 3\,9 \\ \times\,\ 5 \\ \hline \end{array}$$

20. Don bought 30 feet of cable for a dog run. How many yards long will his dog run be? _____

   If the cost of the cable is $6 a yard, what is the total cost? _____

21. A parallelogram has a base of 14 inches and a height of 18 inches. What is its area? _____

22. Paul drove 46 miles this morning and 28 miles this afternoon. How many miles did he drive today? _____

SYSTEMATIC REVIEW

Divide.

1. $6\overline{)48}$

2. $6\overline{)18}$

3. $6\overline{)12}$

4. $6\overline{)36}$

5. $9\overline{)72}$

6. $6\overline{)54}$

7. $3\overline{)27}$

8. $5\overline{)45}$

9. $70 \div 10 =$ _____

10. $16 \div 2 =$ _____

11. $\dfrac{42}{6} =$ _____

12. $\dfrac{60}{6} =$ _____

Add or subtract.

13.
```
  8 5
+ 1 8
```

14.
```
  4 7
− 3 8
```

15.
```
  4 9
+ 2 1
```

16.
```
  6 4
− 2 5
```

Multiply. Check your work with place value-notation.

17.
```
  3 3
× 2 4
```

18.
```
  4 4
× 1 4
```

19.
```
  1 5
× 1 5
```

20. Twenty-four people are lined up for a ride at the fair. If six people can ride at one time, how many turns will be needed to give everyone a ride? _____

21. Mr. Rich made $35 an hour. If he worked for 14 hours, how much did he earn? _____

22. A parallelogram has an area of 42 square feet. If the height is six feet, what is the length of the base? (divide) _____

APPLICATION & ENRICHMENT

Color the picture. Complete each step in the order given for best results. If you have already colored a number, do not color it again in the next step.

If the number has six as a factor, color the space lavender or purple.
If the number has 10 but not six as a factor, color the space blue.
If the number has nine but not six as a factor, color the space red.
If there is no number, leave the space white.
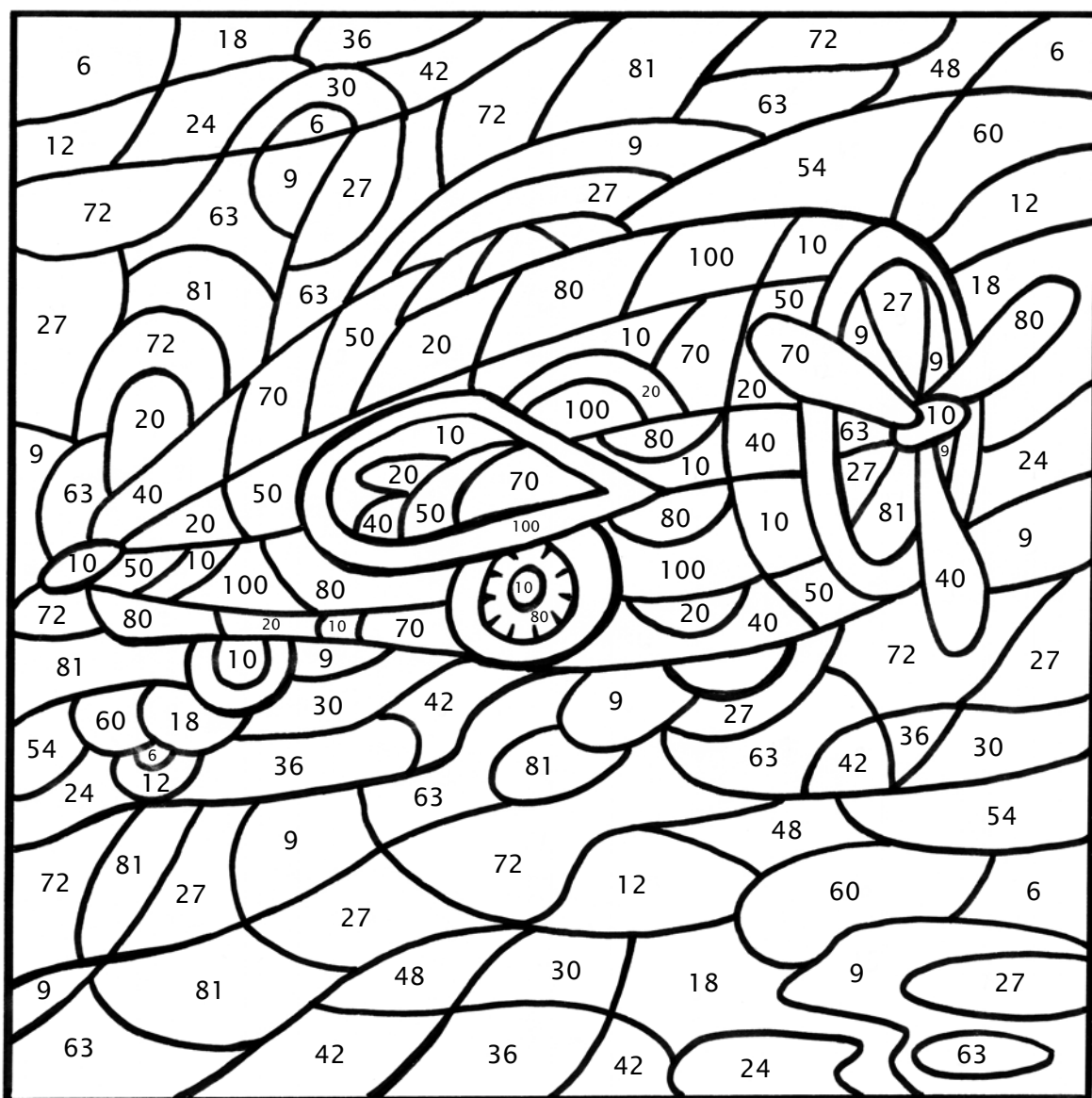
Quadrilateral is a big word that means "four sides." Parallelograms, rectangles, and squares are all quadrilaterals. There are other kinds of quadrilaterals as well.

1. Put a black X on every shape that is not a quadrilateral.
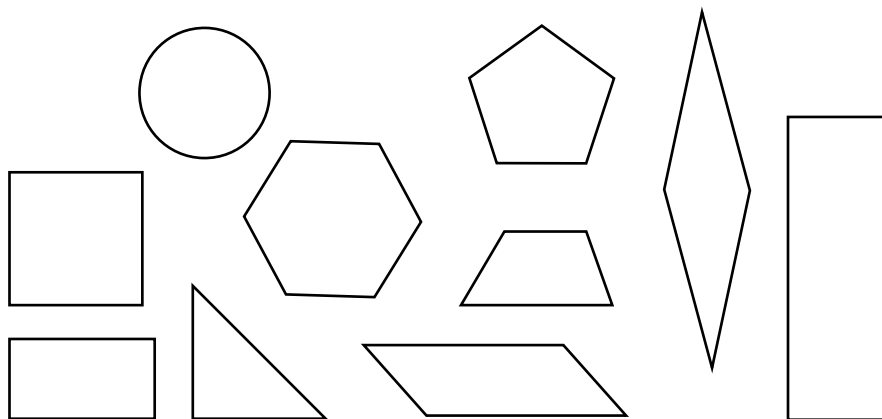
A quadrilateral with two sets of parallel sides is a *parallelogram.* Some parallelograms have square corners and some do not.

2. Draw a red circle around the parallelograms.

    How many parallelograms did you find? _____

A parallelogram with four square corners or right angles is a *rectangle.*

3. Draw green circles around the rectangles. Some shapes will have both red and green circles.

    How many rectangles did you find? _____

4. A square is a special rectangle that has all four sides the same length. Color the square blue.

Divide.

1. $6\overline{)12}$

2. $6\overline{)24}$

3. $6\overline{)54}$

4. $6\overline{)30}$

5. $6\overline{)42}$

6. $6\overline{)48}$

7. $6\overline{)18}$

8. $6\overline{)36}$

9. $72 \div 9 =$ _____

10. $20 \div 5 =$ _____

11. $\dfrac{8}{2} =$ ____

12. $\dfrac{27}{3} =$ ____

Add or subtract.

13.
$$\begin{array}{r} 2\ 3 \\ -\ \ \ 5 \\ \hline \end{array}$$

14.
$$\begin{array}{r} 7\ 2 \\ +\ 1\ 9 \\ \hline \end{array}$$

15.
$$\begin{array}{r} 5\ 3 \\ -\ 4\ 5 \\ \hline \end{array}$$

Multiply.

16.
$$\begin{array}{r} 2\ 2 \\ \times\ 1\ 3 \\ \hline \end{array}$$

17.
$$\begin{array}{r} 4\ 5 \\ \times\ 2\ 4 \\ \hline \end{array}$$

18.
$$\begin{array}{r} 1\ 6 \\ \times\ 3\ 7 \\ \hline \end{array}$$

19. Jeremy was bored, so he counted people's feet as they walked by. If he counted 20 feet, how many people had gone by? _____

20. A parallelogram has an area of 36 square feet. If the height is six feet, what is the length of the base? _____

10. $8 \div 1 = \underline{8}$

11. $\dfrac{81}{9} = \underline{9}$

12. $\dfrac{21}{3} = \underline{7}$

13. $4 \times \underline{6} = 24$

14. $6 \times \underline{10} = 60$

15. $6 \times \underline{7} = 42$

16. $4 \times \underline{7} = 28$

17.
$$\begin{array}{r} 71 \\ +62 \\ \hline 133 \end{array}$$

18.
$$\begin{array}{r} {}^3\cancel{4}\,{}^13 \\ -\ 2\ 5 \\ \hline 1\ 8 \end{array}$$

19.
$$\begin{array}{r} 92 \\ +11 \\ \hline 103 \end{array}$$

20.
$$\begin{array}{r} {}^1\ \\ 57 \\ +46 \\ \hline 103 \end{array}$$

21. parallel

22. $5 \times 3 = 15$ sq yd

Systematic Review 7F

1. $6 \times 7 = 42$ sq ft

2. $3 \times 8 = 24$ sq in

3. $10 \times 9 = 90$ sq ft

4. $3 \times 3 = 9$ sq mi

5. $27 \div 9 = \underline{3}$

6. $15 \div 3 = \underline{5}$

7. $30 \div 5 = \underline{6}$

8. $16 \div 2 = \underline{8}$

9. $72 \div 9 = \underline{8}$

10. $90 \div 10 = \underline{9}$

11. $\dfrac{20}{2} = \underline{10}$

12. $\dfrac{45}{9} = \underline{5}$

13. $4 \times \underline{8} = 32$

14. $6 \times \underline{8} = 48$

15. $6 \times \underline{6} = 36$

16. $4 \times \underline{4} = 16$

17.
$$\begin{array}{r} {}^1\cancel{2}\,{}^11 \\ -\ \ 9 \\ \hline 1\ 2 \end{array}$$

18.
$$\begin{array}{r} {}^1\ \\ 76 \\ +54 \\ \hline 130 \end{array}$$

19.
$$\begin{array}{r} 33 \\ +45 \\ \hline 78 \end{array}$$

20.
$$\begin{array}{r} {}^5\cancel{6}\,{}^14 \\ -\ 2\ 5 \\ \hline 3\ 9 \end{array}$$

21. $14 \div 2 = 7$ qt

22. $30 - 16 = 14$ books

Lesson Practice 8A

1. 6,12,18;$\underline{3}$

2. 6,12,18,24,30,36,42,48,54;$\underline{9}$

3. 6,12;$\underline{2}$

4. 6,12,18,24,30,36,42,48,54,60;$\underline{10}$

5. $12 \div 6 = \underline{2}$

6. $6 \div 6 = \underline{1}$

7. $24 \div 6 = \underline{4}$

8. $36 \div 6 = \underline{6}$

9. $42 \div 6 = \underline{7}$

10. $18 \div 6 = \underline{3}$

11. $60 \div 6 = \underline{10}$

12. $24 \div 6 = \underline{4}$

13. $42 \div 6 = \underline{7}$

14. $\dfrac{54}{6} = \underline{9}$

15. $\dfrac{30}{6} = \underline{5}$

16. $48 \div \underline{6} = 8$

17. $24 \div 6 = 4$ ants

18. $\$30 \div 6 = \$5$ a day