

Chapter 2 Writing and Evaluating Expressions

Exercise 1

Basics

In general, calculate from left to right.
Find the value in parentheses first.

- 1** 75 craft sticks are required to make a large box, and 25 craft sticks are required to make a small box. Aisha is making sets that include one large and one small box. How many sets could she make with 500 craft sticks?

$$\begin{aligned} \text{Total craft sticks} &\div \text{Number of craft sticks per set} \\ = 500 &\div (\square + \square) \\ = 500 &\div \square \\ = &\square \end{aligned}$$

2 (a) $800 - 120 + 250$

$$\begin{aligned} &= \square + 250 \\ &= \square \end{aligned}$$

(c) $320 \div 4 \times 5$

$$\begin{aligned} &= \square \times 5 \\ &= \square \end{aligned}$$

(b) $800 - (120 + 250)$

$$\begin{aligned} &= 800 - \square \\ &= \square \end{aligned}$$

(d) $320 \div (4 \times 5)$

$$\begin{aligned} &= 320 \div \square \\ &= \square \end{aligned}$$

Practice

3 Find the values.

(a) $400 - 53 - 27$

(b) $400 - (53 - 27)$

(c) $81 \div 9 \div 3$

(d) $81 \div (9 \div 3)$

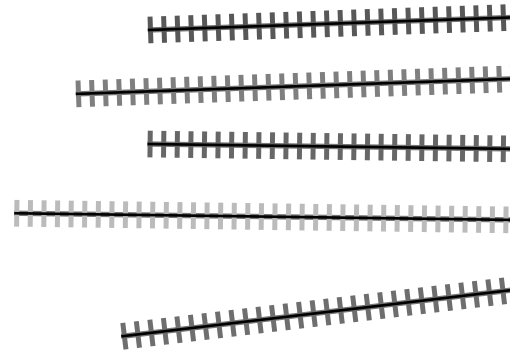
(e) $180 \div (2 \times 3)$

(f) $4 \times (60 - 22)$

(g) $1,000 \div (48 \div 6)$

(h) $640,000 \div (7,000 - 3,000)$

- 4 Jamal had a package of 200 pipe cleaners. He made 3 woven baskets. Each basket used 35 pipe cleaners. Write an expression to find the number of pipe cleaners he has left, and then find the value.



Challenge

- 5 In each of the following, use each of the numbers 9, 3, and 3 once to make the equations true.

(a) $\square \times \square \div \square = 9$

(b) $\square \div \square - \square = 0$

(c) $\square \times (\square - \square) = 0$

(d) $\square \times (\square \div \square) = 9$

(e) $\square - \square - \square = 3$

(f) $\square \div (\square \times \square) = 1$

(g) $\square + (\square - \square) = 9$

(h) $\square - \square + \square = 9$

Exercise 2

Basics

In general, calculate from left to right.
Do multiplication and/or division first.
Then do addition and/or subtraction.

- 1** Jett is making 2 boxes and 3 picture frames using craft sticks. Each box requires 125 sticks and each picture frame requires 75 sticks. How many craft sticks does he need?

$$\begin{aligned} & \text{Number of sticks for box} \quad + \quad \text{Number of sticks for frame} \\ = & \quad 2 \times 125 \quad + \quad 3 \times 75 \\ = & \quad \boxed{} \quad + \quad \boxed{} \\ = & \quad \boxed{} \end{aligned}$$

2 (a) $15 + 500 \div 2$

$$\begin{aligned} & = 15 + \boxed{} \\ & = \boxed{} \end{aligned}$$

(b) $4 \times 2 - 10 \div 5$

$$\begin{aligned} & = \boxed{} - \boxed{} \\ & = \boxed{} \end{aligned}$$

(c) $54 - 8 \times 5 + 10$

$$\begin{aligned} & = 54 - \boxed{} + 10 \\ & = \boxed{} + 10 \\ & = \boxed{} \end{aligned}$$

(d) $75 - 420 \div 7 + 3 \times 15$

$$\begin{aligned} & = 75 - \boxed{} + \boxed{} \\ & = \boxed{} + \boxed{} \\ & = \boxed{} \end{aligned}$$

Exercise 5

Basics

- 1 Divide 87 by 21.

Emma estimated: $80 \div 20 = 4$

$$\begin{array}{r} 4 \\ 21 \overline{) 87} \\ \underline{0} \\ 0 \\ \underline{0} \\ 0 \end{array}$$

← 21×4

- 2 Divide 86 by 24.

Dion estimated: $80 \div 20 = 4$

$$\begin{array}{r} 4 \\ 24 \overline{) 86} \\ \underline{96} \end{array}$$

← 24×4

Too large, try 1 less.

$$\begin{array}{r} 3 \\ 24 \overline{) 86} \\ \underline{0} \\ 0 \\ \underline{0} \\ 0 \end{array}$$

← 24×3

- 3 Divide 71 by 16.

Alex estimated: $60 \div 20 = 3$

$$\begin{array}{r} 3 \\ 16 \overline{) 71} \\ \underline{48} \\ 23 \end{array}$$

← 16×3

Too small, try 1 more.

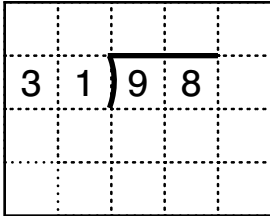
$$\begin{array}{r} 4 \\ 16 \overline{) 71} \\ \underline{0} \\ 0 \\ \underline{0} \\ 0 \end{array}$$

← 16×4

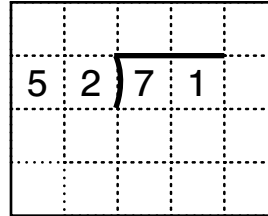
Practice

4 Divide.

(a) $98 \div 31$



(b) $71 \div 52$



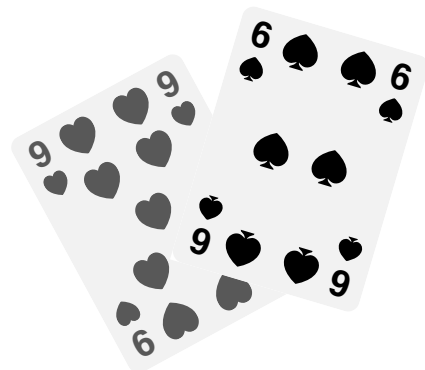
(c) $91 \div 13$

(d) $61 \div 22$

(e) $76 \div 23$

(f) $58 \div 14$

5 52 cards are dealt out to 12 players. How many cards does each player get?
How many cards are left over?

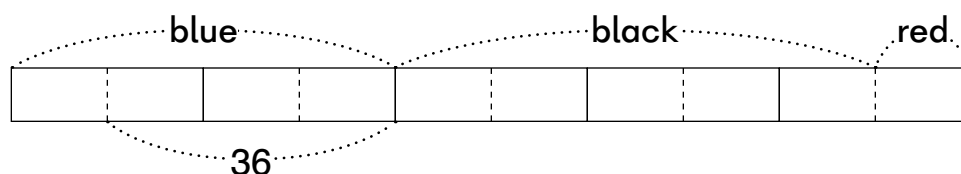


Exercise 3

Basics

- 1 $\frac{2}{5}$ of the pens in a box are blue. $\frac{1}{2}$ of them are black. The rest of them are red. There are 36 more blue pens than red pens. How many pens are there altogether?

$$\frac{2}{5} = \frac{4}{10} \quad \frac{1}{2} = \frac{5}{10}$$

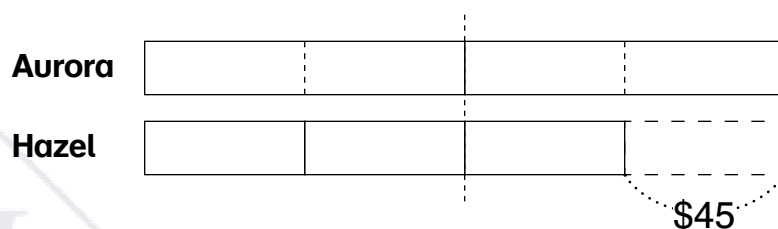


$$3 \text{ units} \rightarrow 36$$

$$1 \text{ unit} \rightarrow \frac{36}{3} =$$

$$10 \text{ units} \rightarrow$$

- 2 $\frac{1}{2}$ of Aurora's savings is equal to $\frac{2}{3}$ of Hazel's savings. After Hazel saved another \$45, they both had the same amount of money. How much money did Aurora save?

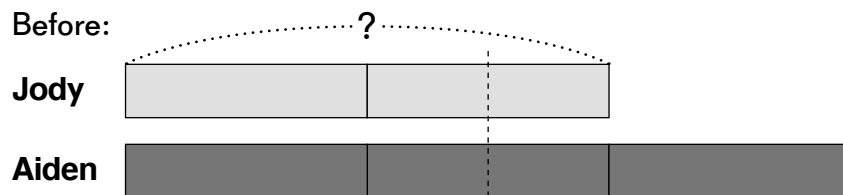


$$1 \text{ unit} \rightarrow 45$$

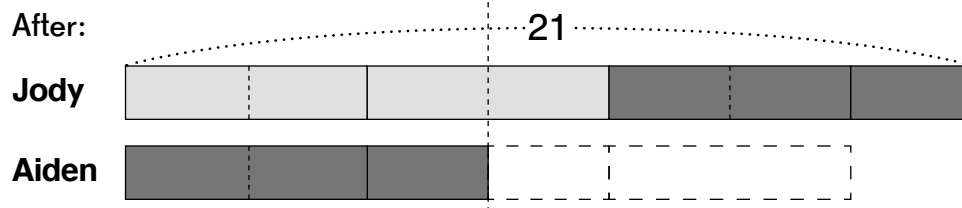
$$4 \text{ units} \rightarrow$$

- 3 Jody had $\frac{2}{3}$ as many action figures as Aiden. After Aiden gave $\frac{1}{2}$ of his action figures to Jody, Jody had 21 action figures. How many action figures did Jody have at first?

Before:



After:



$$7 \text{ units} \rightarrow 21$$

$$1 \text{ unit} \rightarrow \frac{21}{7} =$$

$$4 \text{ units} \rightarrow$$

Practice

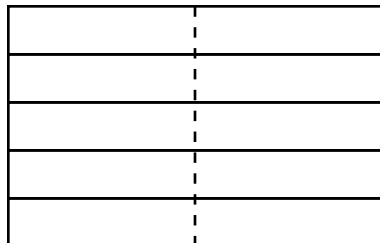
- 4 Sarah spent $\frac{2}{5}$ of her money on a keyboard. If the keyboard cost \$240, how much money did she have at first?



Exercise 5

Basics

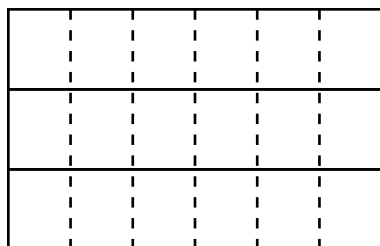
- 1 Shade the rectangle to show $\frac{1}{2}$ of $\frac{3}{5}$.



$$\frac{1}{2} \times \frac{3}{5} = \frac{1 \times 3}{2 \times 5}$$

$$= \frac{\quad}{\quad}$$

- 2 Shade the rectangle to show $\frac{1}{6}$ of $\frac{2}{3}$.

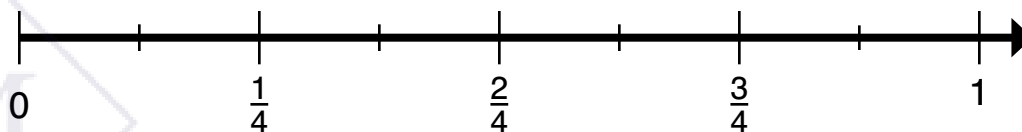
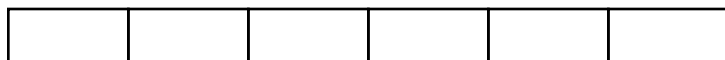


$$\frac{1}{6} \times \frac{2}{3} = \frac{1 \times 2}{6 \times 3}$$

$$= \frac{\quad}{18}$$

$$= \frac{\quad}{\quad}$$

- 3 Shade the bar and draw an arrow on the number line to show $\frac{1}{6}$ of $\frac{3}{4}$.



$$\frac{1}{6} \times \frac{3}{4} = \frac{1 \times 3}{6 \times 4} = \frac{\quad}{24} = \frac{\quad}{\quad}$$

Practice

4 Find the values. Express each answer in simplest form.

(a) $\frac{1}{4} \times \frac{1}{6}$

(b) $\frac{1}{3} \times \frac{3}{5}$

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

(d) $\frac{1}{2} \times \frac{6}{7}$

(e) $\frac{1}{6} \times \frac{3}{10}$

(f) $\frac{1}{12} \times \frac{3}{4}$

(g) $\frac{1}{9} \times \frac{6}{7}$

(h) $\frac{1}{9} \times \frac{72}{100}$

5 John has a garden with an area of $\frac{4}{5}$ acres. He planted herbs in $\frac{1}{8}$ of the garden. How many acres did he plant with herbs?

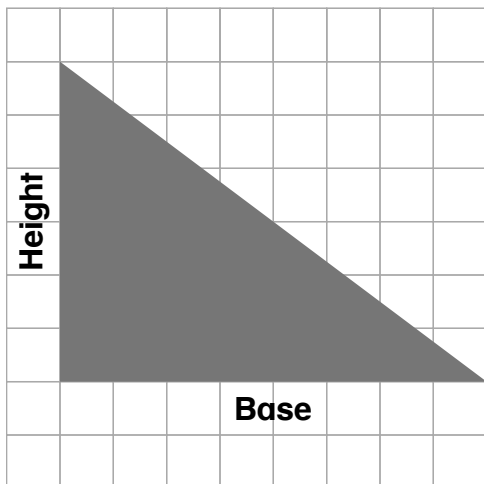


Exercise 4

Basics

1 Find the area of each triangle. Each square represents 1 cm².

(a)

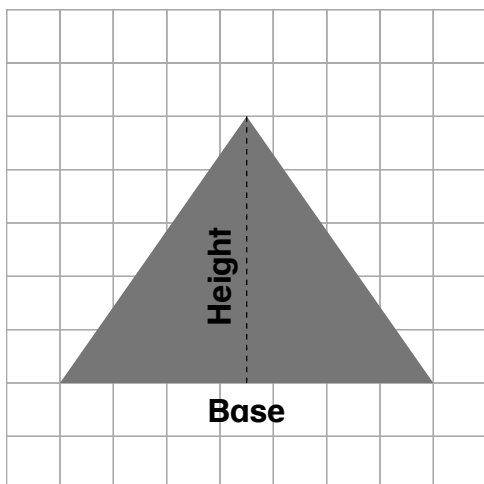


$$\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$$

$$= \frac{1}{2} \times 8 \times 6$$

$$= \boxed{} \text{ cm}^2$$

(b)

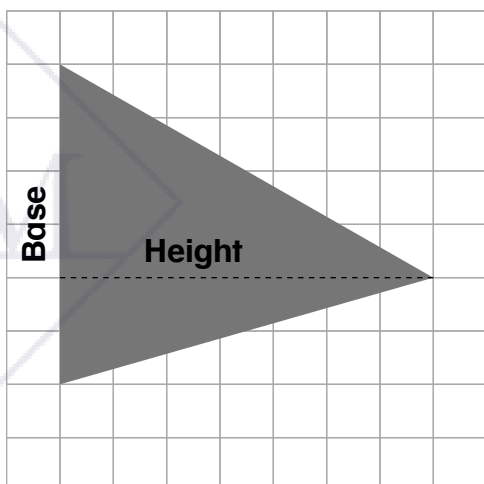


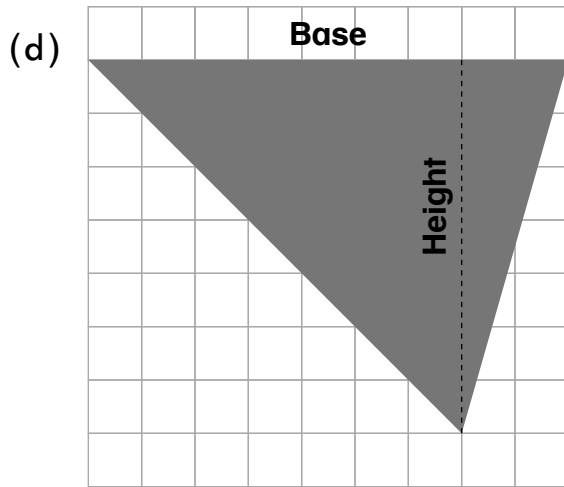
$$\text{Area} = \frac{1}{2} \times 7 \times 5$$

$$= \frac{\boxed{}}{2}$$

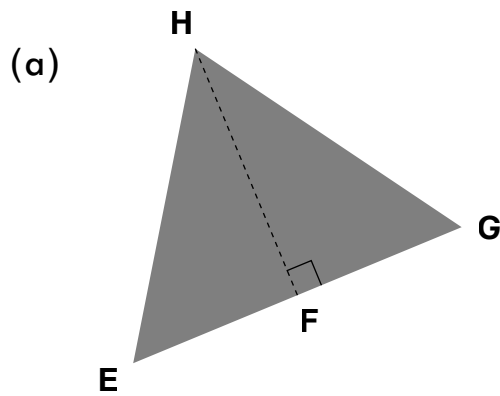
$$= \boxed{} \boxed{} \text{ cm}^2$$

(c)



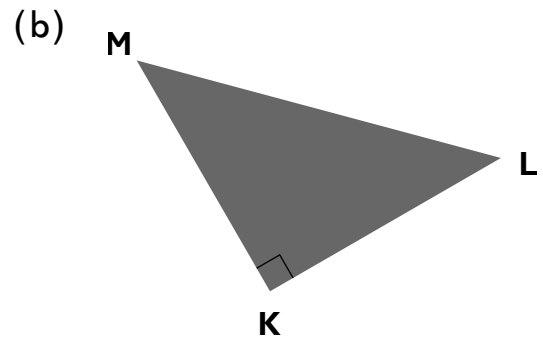


2 For each triangle, identify a base (if required) and a corresponding height.



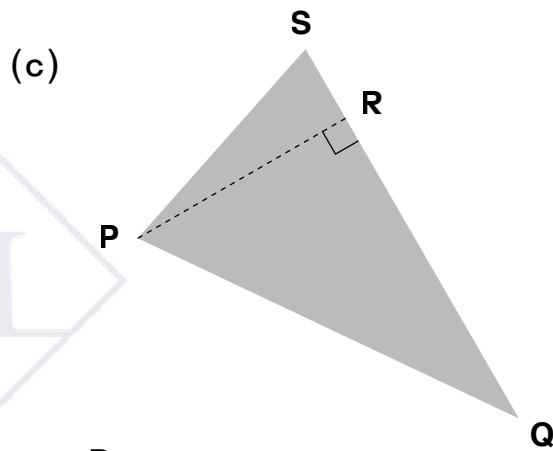
Base = EG

Height =



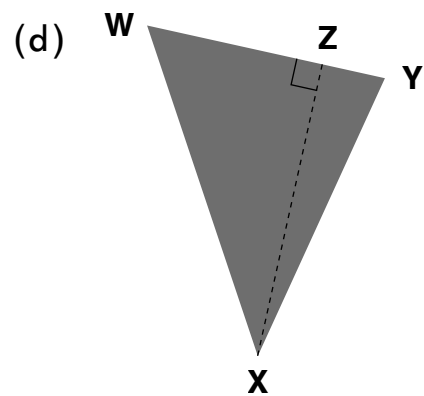
Base = MK

Height =



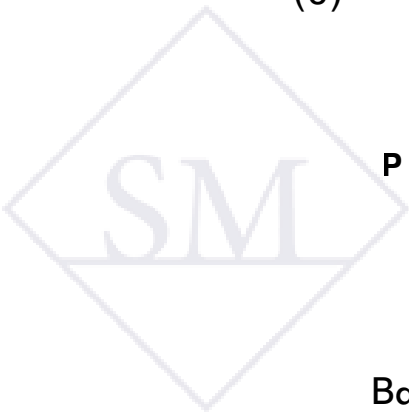
Base =

Height =



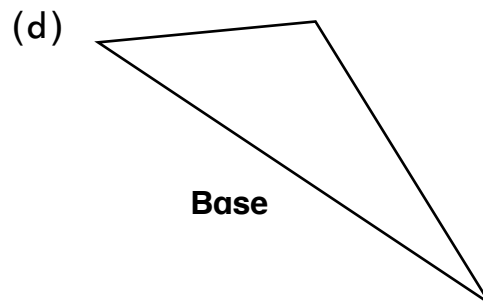
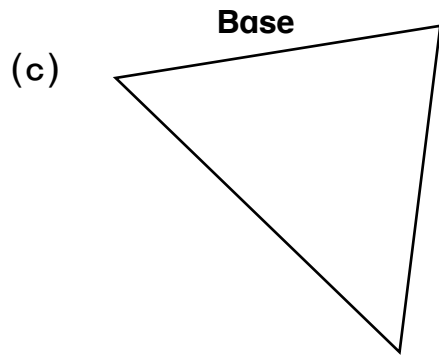
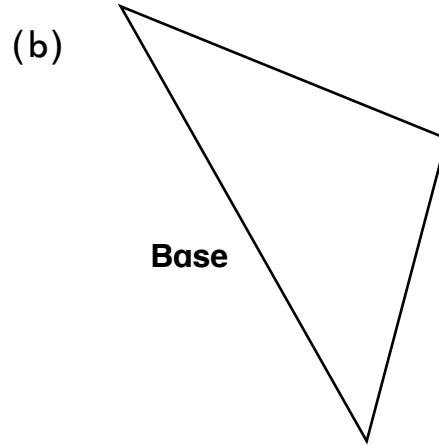
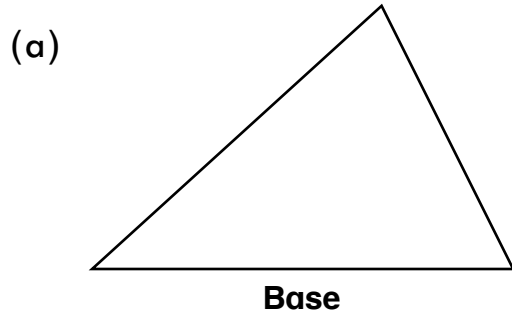
Base =

Height =



Practice

3 Draw a height for the given base of each of these triangles.



4 Find the area of each shaded triangle.

