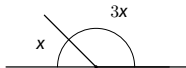


Combined Angle Problems — Answers



1. On a straight line, one angle is three times another. Find both angles.

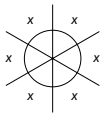


Solution

$$x + 3x = 180^\circ$$

$$x = 45^\circ, 3x = 135^\circ$$

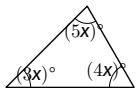
2. Six angles around a point are equal. Find each angle.



Solution

$$\begin{aligned}\text{Each} &= 360^\circ \div 6 \\ &= 60^\circ\end{aligned}$$

3. A triangle has angles $(3x)^\circ$, $(4x)^\circ$, and $(5x)^\circ$. Find x .



Solution

$$12x = 180^\circ$$

$$x = 15^\circ: 45^\circ, 60^\circ, 75^\circ$$

4. At a point, five angles are $(2x)^\circ$, $(x + 10)^\circ$, $(3x - 20)^\circ$, x° , and 60° . Find x .

Solution

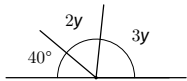
$$7x + 50^\circ = 360^\circ$$

$$7x = 310^\circ, x = 44\frac{2}{7}^\circ$$

Ratios & Multi-step Angles – Answers



5. A straight line has three angles. One is 40° . The other two are in ratio 2 : 3. Find them.

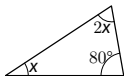


Solution

$$40^\circ + 5y = 180^\circ$$

$$y = 28^\circ: 56^\circ, 84^\circ$$

6. In a triangle, the largest angle is twice the smallest. The middle angle is 80° . Find all angles.



Solution

$$3x + 80^\circ = 180^\circ$$

$$x = 33\frac{1}{3}^\circ, 2x = 66\frac{2}{3}^\circ$$

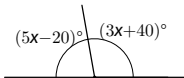
7. Four angles around a point are in ratio 3 : 4 : 5 : 6. Find the difference between the largest and smallest.

Solution

$$\text{Each part} = 360^\circ \div 18 = 20^\circ$$

$$6(20^\circ) - 3(20^\circ) = 60^\circ$$

8. Two straight lines intersect. If one angle is $(5x - 20)^\circ$ and its adjacent angle is $(3x + 40)^\circ$, find x .



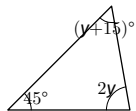
Solution

$$8x + 20^\circ = 180^\circ$$

$$x = 20$$

Multi-step Angle Applications — Answers

9. A triangle's angles are 45° , $2y$, and $(y+15)^\circ$. Find y and all angles.



Solution

$$3y + 60^\circ = 180^\circ$$

$$y = 40^\circ: 80^\circ, 55^\circ$$

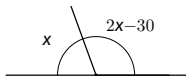
10. At a point, angles are in ratio $1 : 2 : 2 : 3 : 4 : 6$. Find the largest angle.

Solution

Parts sum to 18; each = 20° .

$$\text{Largest} = 6 \times 20^\circ = 120^\circ$$

11. An angle on a line is 30° less than twice another. Find both angles.

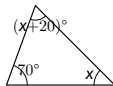


Solution

$$3x = 210^\circ$$

$$x = 70^\circ: 70^\circ, 110^\circ$$

12. A triangle has one angle 70° and another is 20° more than the third. Find the other two angles.



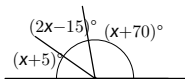
Solution

$$2x + 90^\circ = 180^\circ$$

$$x = 45^\circ: 45^\circ, 65^\circ$$

Multi-step Angle Applications — Answers

13. Three angles on a straight line are $(x + 5)^\circ$, $(2x - 15)^\circ$, and $(x + 70)^\circ$. Find x .



Solution

$$4x + 60^\circ = 180^\circ$$

$$x = 30$$

15. In triangle ABC , angle A is $\frac{2}{3}$ of angle B , and angle C is 50° . Find angles A and B .

Solution

Let $B = 3y$, $A = 2y$: $5y + 50^\circ = 180^\circ$

Basic Angle Rules $A = 52^\circ$, $B = 78^\circ$

14. Two intersecting lines form an angle of $2x^\circ$. What is the sum of all four angles formed?

Solution

The four angles make a full turn.

$$\text{Sum} = 360^\circ.$$

16. Seven angles around a point increase by 5° each. Find the smallest angle.

Solution

$$7x + 105^\circ = 360^\circ$$

$$7x = 255^\circ, x = 36\frac{3}{7}^\circ$$

Angle Reasoning & Proof — Answers



17. A triangle's exterior angle is 130° . If one remote interior angle is 50° , prove the other must be 80° .

Solution

Exterior = sum of remote interiors.

$$50^\circ + x = 130^\circ \Rightarrow x = 80^\circ \text{ (proven)}$$

18. On a line, angles are x° , $(180 - 2x)^\circ$, and x° . Find x if all angles are positive.

Solution

$x + (180 - 2x) + x = 180^\circ$ is always true.

For positive angles: $0 < x < 90$