

SAT Lines, Angles, and Triangles Worksheet

Name: _____ Date: _____

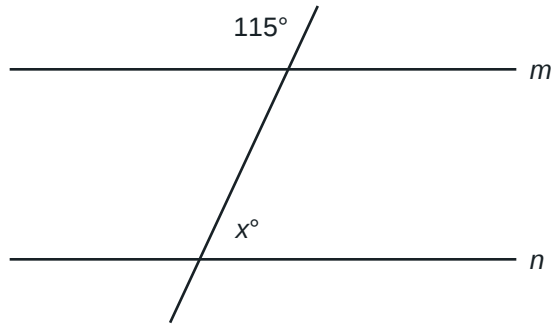
Circle one answer for each question. Use the blank space for calculations. A calculator is allowed.

1. Two angles form a linear pair. One of the angles measures 128° . What is the measure, in degrees, of the other angle?
A. 52
B. 62
C. 128
D. 232

2. In triangle ABC, the measure of angle A is 47° and the measure of angle B is 68° . What is the measure, in degrees, of angle C?
A. 43
B. 55
C. 65
D. 115

3. Two lines intersect, forming vertical angles with measures $(3x + 10)$ degrees and $(5x - 20)$ degrees. What is the value of x ?
A. 15
B. 23.75
C. 45
D. 55

4.



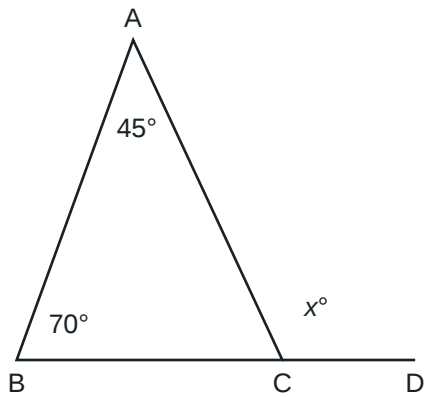
In the figure, lines m and n are parallel. What is the value of x ?

- A. 25
- B. 55
- C. 65
- D. 115

5. In triangle PQR, $PQ = PR$ and the measure of angle P is 40° . What is the measure, in degrees, of angle Q?

- A. 40
- B. 70
- C. 100
- D. 140

6.



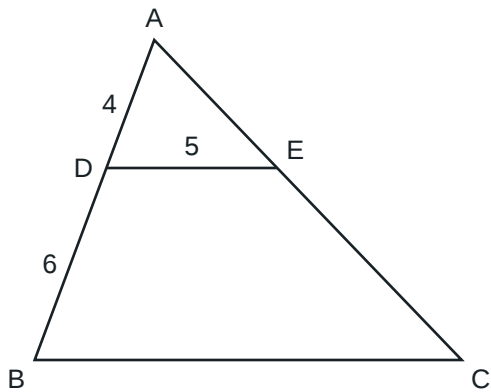
In the figure, points B, C, and D lie on a line. What is the value of x ?

- A. 45
- B. 65
- C. 70
- D. 115

7. In triangle XYZ, the measure of angle X is 20° greater than the measure of angle Y, and the measure of angle Z is twice the measure of angle Y. What is the measure, in degrees, of angle Z?

- A. 40
- B. 60
- C. 70
- D. 80

8.



In the figure, segment DE is parallel to segment BC. What is the length of BC?

- A. 7.5
- B. 11
- C. 12
- D. 12.5

9. What is the measure, in degrees, of each interior angle of a regular octagon?

- A. 108
- B. 120
- C. 135
- D. 1,080

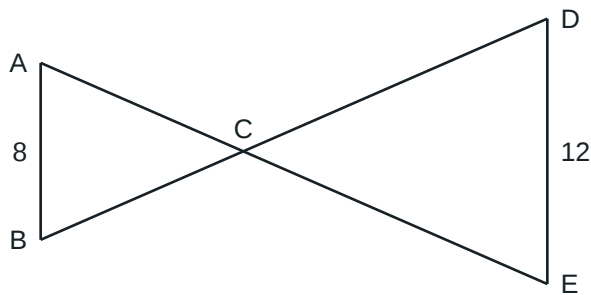
10. Two parallel lines are cut by a transversal. Two same-side interior angles have measures $(5x + 12)$ degrees and $(3x + 8)$ degrees. What is the value of x ?

- A. -2
- B. 20
- C. 68
- D. 112

11. Triangle ABC is similar to triangle DEF, with A, B, and C corresponding to D, E, and F. In triangle ABC, $AB = 5$, $BC = 7$, and $AC = 8$. The perimeter of triangle DEF is 30. What is the length of EF?

- A. 7
- B. 10.5
- C. 12
- D. 17

12.



In the figure, segment AB is parallel to segment DE , and segments AE and BD intersect at point C . If $AB = 8$, $DE = 12$, and $AE = 25$, what is the length of AC ?

- A. 10
- B. 12.5
- C. 15
- D. 16

Answer key

1 **A** · 2 **C** · 3 **A** · 4 **C** · 5 **B** · 6 **D** · 7 **D** · 8 **D** · 9 **C** · 10 **B** · 11 **B** · 12 **A**

1. A: 52

Angles that form a linear pair add to 180° , so the other angle measures $180 - 128 = 52^\circ$. Choice D subtracts from 360° instead.

2. C: 65

The angles of a triangle add to 180° , so angle C measures $180 - 47 - 68 = 65^\circ$. Choice D is the sum of angles A and B.

3. A: 15

Vertical angles are equal, so $3x + 10 = 5x - 20$. Then $30 = 2x$ and $x = 15$. Choice D is the angle measure, $3(15) + 10 = 55$, and choice B treats the angles as supplementary.

4. C: 65

Because m and n are parallel, the angle to the left of x at line n is also 115° ; the two are corresponding angles. That angle and x form a straight line, so $x = 180 - 115 = 65$. Choice D assumes the two marked angles are equal.

5. B: 70

Since $PQ = PR$, the angles opposite those sides, angles R and Q, are equal. Together they measure $180 - 40 = 140^\circ$, so each is 70° . Choice D is their combined measure.

6. D: 115

The angles of triangle ABC add to 180° , so angle ACB is $180 - 45 - 70 = 65^\circ$. Angle x forms a straight line with angle ACB, so $x = 180 - 65 = 115$. That equals $45 + 70$, the sum of the angles at A and B. Choice B is angle ACB.

7. D: 80

Let angle Y be y degrees. Then $y + (y + 20) + 2y = 180$, so $4y = 160$ and $y = 40$. Angle Z is $2(40) = 80^\circ$. Choices A and B are the measures of angles Y and X.

8. D: 12.5

Because DE is parallel to BC, triangle ADE is similar to triangle ABC. $AB = 4 + 6 = 10$, so BC is $\frac{10}{4} = 2.5$ times DE, and $BC = 2.5(5) = 12.5$. Choice A uses the ratio of DB to AD instead of AB to AD.

9. C: 135

Diagonals from one vertex split an octagon into 6 triangles, so its angles add to $6(180) = 1,080^\circ$. Dividing 1,080 by 8 equal angles gives 135° . Choice D is the sum of all 8 angles.

10. B: 20

Same-side interior angles between parallel lines add to 180° : $(5x + 12) + (3x + 8) = 180$. Then $8x = 160$ and $x = 20$. Choice A comes from setting the angles equal, which applies to alternate interior angles, not same-side interior angles.

11. B: 10.5

The perimeter of triangle ABC is $5 + 7 + 8 = 20$, so triangle DEF is $\frac{30}{20} = 1.5$ times as large. EF corresponds to BC, so $EF = 1.5(7) = 10.5$. Choice C scales AC instead of BC.

12. A: 10

Since AB is parallel to DE, triangle ABC is similar to triangle EDC, with AC matching EC. So AC and EC are in the ratio 8 to 12, or 2 to 3. Splitting $AE = 25$ into 5 equal parts gives $AC = 2(5) = 10$ and $EC = 3(5) = 15$. Choice C is EC.