

SAT Preparation Exercises (Chapter 3)

I. MULTIPLE-CHOICE QUESTIONS

In 1–12, select the letter of the correct answer.

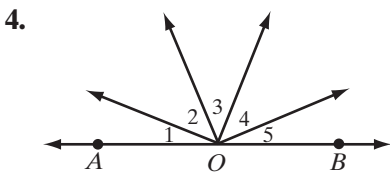
1. The relation “weighs within 3 grams of” has which of the following properties?

- I. reflexive
- II. symmetric
- III. transitive

- (A) I only
 - (B) II only
 - (C) I and II only
 - (D) II and III only
 - (E) I, II, and III
2. Which of the following is NOT an equivalence relation among people?
- (A) is the same age as
 - (B) has the same last name as
 - (C) is the same height as
 - (D) is younger than
 - (E) has the same eye color as

3. The relation “is older than” has which of the following properties?

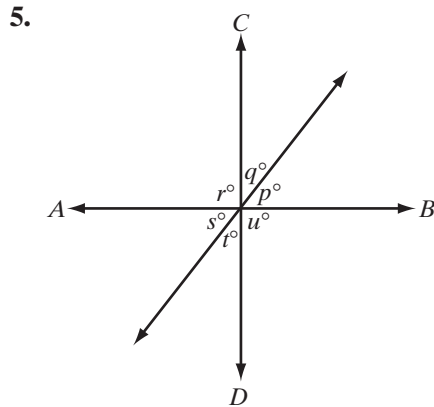
- I. reflexive
 - II. symmetric
 - III. transitive
- (A) I only
 - (B) II only
 - (C) III only
 - (D) I and II only
 - (E) II and III only



Note: Figure not drawn to scale.

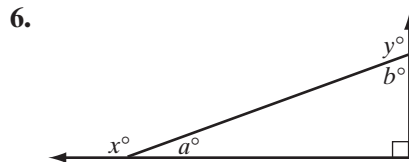
The degree measures of the five angles shown above are consecutive integers. If AOB is a line, what is the degree measure of the smallest angle?

- (A) 32
- (B) 33
- (C) 34
- (D) 35
- (E) 36



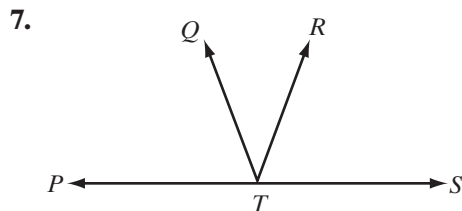
In the figure above, $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$. Which of the following is NOT necessarily equal to 180?

- (A) $p + q + r$
- (B) $r + u$
- (C) $p + r + t$
- (D) $u + p + s$
- (E) $q + s + u$



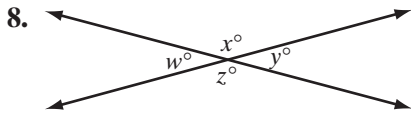
In the figure above, $a + b = 90$. What is the average (arithmetic mean) of x and y ?

- (A) 45
- (B) 90
- (C) 120
- (D) 135
- (E) 180



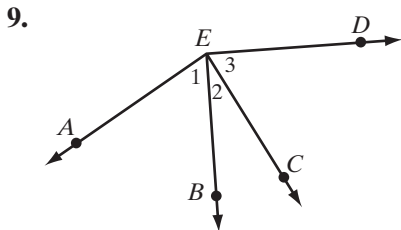
In the figure above, the measure of angle PTR is 100 and the measure of angle QTS is $(x + 80)$. Which of the following represents the measure of angle QTR in terms of x ?

- (A) 20
- (B) x
- (C) $(100 - x)$
- (D) $(180 - x)$
- (E) $(180 + x)$



In the figure above, angle x is congruent to angle z and angle w is congruent to angle y . If the average (arithmetic mean) of w , x and y is 70, what is the value of z ?

- (A) 30 (B) 60 (C) 90
(D) 120 (E) 150



In the figure above, $\overline{AE} \perp \overline{EC}$ and $\overline{BE} \perp \overline{ED}$. If the measure of angle 1 is $(4)(6)(x)$ and the measure of angle 3 is $(8)(9)$, which of the following expressions represents the measure of angle 2 in terms of x ?

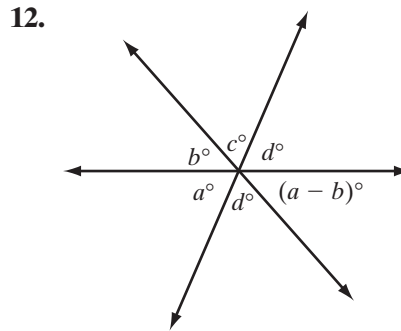
- (A) x (B) $3x$ (C) $6x$
(D) $9x$ (E) $18x$

10. Two angles form a straight angle. If the measure of angle x is 150 more than the measure of angle y , what is the measure of angle y ?

- (A) 10 (B) 15 (C) 20
(D) 25 (E) 30

11. If $A, B, C,$ and D lie on the same straight line and if $AC = 2CD = 3BD$, what is the value of the ratio $\frac{BC}{CD}$?

- (A) $\frac{1}{6}$ (B) $\frac{1}{3}$
(C) $\frac{1}{2}$ (D) $\frac{5}{3}$
(E) Cannot be determined



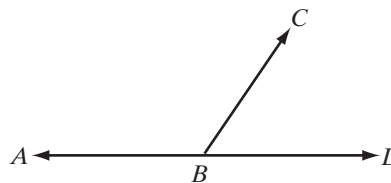
Note: Figure not drawn to scale.

- In the figure above, what is the value of b ?
- (A) 30 (B) 36 (C) 45
(D) 60 (E) 72

II. STUDENT-PRODUCED RESPONSE QUESTIONS

In 13–20, you are to solve the problem.

13.



In the figure above, the measure of angle ABC is $(2x + 5y)$ and the measure of angle CBD is $(x - 2y)$. What is the value of $x + y$?

14. If three angles of a triangle have the ratio $a : b : c = 6 : 7 : 11$, what is $c - a$?

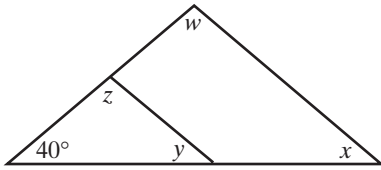
15. Five lines intersect at one point forming ten angles, what is the average measure of each angle?

16. 

Note: Figure not drawn to scale.

For the line segment shown above, $RT = 10$ and $RM = 8$. What is the length of the line segment joining the midpoints of \overline{RT} and \overline{RM} ?

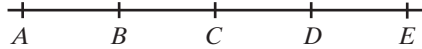
17.



In the figure, what is $w + x + y + z$?

18. Five different points lie in a plane such that M, N, O are collinear and P, N, Q are collinear. $M, N, O, P, N,$ and Q do not all lie on the same line. What is the total number of lines that can be drawn such that each line passes through exactly two of these five points?

19.



Note: Figure not drawn to scale.

In the figure above, B is the midpoint of \overline{AC} and C is the midpoint of \overline{AE} . If the length of AE is 24 and CD is one-fourth the length of CE , what is the length of BD ?

20. Angle x and angle y form a right angle. Angle w and angle z form a straight angle. What is the average (arithmetic mean) of $w, x, y,$ and z ?