

For each question, choose the best answer from the four choices. All answers must be written clearly in the correct blanks on the answer sheet and in simplest form. Exact answers are to be given unless otherwise



4. In the diagram,  $\overline{EB} \perp \overline{AC}$  and points  $A, B$ , and  $C$  are collinear.  $\overline{BF}$  bisects  $\angle CBE$ . If  $\angle CBE = 38^\circ$  and  $\angle CBD = 14^\circ$ , find the value of  $\angle EBD$ .



5. If the parallelogram has a transversal line intersecting the two parallel lines, which of the following angles are congruent?

17. Let  $\ell$  be a line intersecting the  $x$ -axis at  $(p, 0)$  and the  $y$ -axis at  $(0, q)$ , where  $p > 0$  and  $q > 0$ . If the area of the triangle formed by the  $x$ -axis, the  $y$ -axis, and  $\ell$  is 120, what is the value of  $p + q$ ?

18. One of the following points is located in the third quadrant of the  $xy$ -plane. Which one?

- (A)  $(-2, -3)$
- (B)  $(-2, 3)$
- (C)  $(2, -3)$
- (D)  $(2, 3)$
- (E)  $(3, -2)$

19. If  $\frac{a}{3-\sqrt{3}} = \frac{b}{d}$  where  $a$ ,  $b$ ,  $c$ , and  $d$  are integers and  $a > 0$ , and the minimum value of  $b$  is 10, what is the value of  $c$ ?

20. Circle  $A$  has center  $(6, -2)$  and radius 5. Circle  $B$  has center  $(-3, 4)$  and radius 3. Find the exact length of the

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**Written Competition Test**

Note: All answers must be written clearly in the boxes below the question number. If you do not know the answer, leave the box blank.

1.  $\frac{1}{2} \times \frac{1}{2} =$

2.  $\frac{1}{2} + \frac{1}{2} =$

3.  $\frac{1}{2} - \frac{1}{2} =$

5. \_\_\_\_\_

15. \_\_\_\_\_

6. \_\_\_\_\_

16. \_\_\_\_\_

7. \_\_\_\_\_

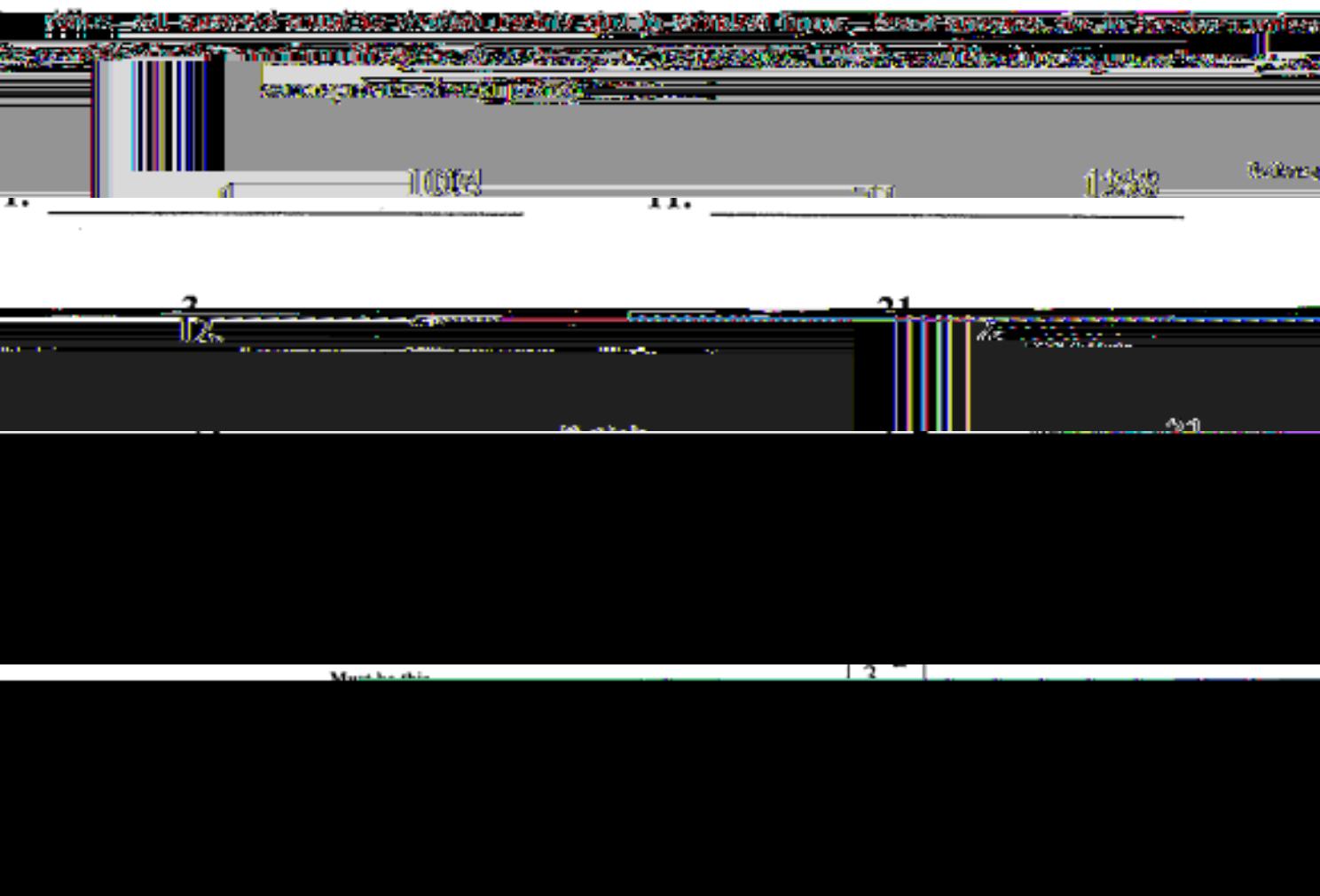
17. \_\_\_\_\_

8. \_\_\_\_\_

18. \_\_\_\_\_

10. \_\_\_\_\_

20. \_\_\_\_\_



7. 342      Dollar sign optional

17      1000

8. 3

18.      1680

9. 507

19.      324

10. 360

20.       $\sqrt{53}$       Must be in  
                        simplified form