G.GPE.B.7: Polygons in the Coordinate Plane

1 Triangle ABC has vertices at $A(3,0)$, $B(9,-5)$, and $C(7,-8)$. Find the length of $\overline{AC}$ in simplest radical form.

2 Square $ABCD$ has vertices $A(-2,-3)$, $B(4,-1)$, $C(2,5)$, and $D(-4,3)$. What is the length of a side of the square?

1) $2\sqrt{5}$
2) $2\sqrt{10}$
3) $4\sqrt{5}$
4) $10\sqrt{2}$

3 The vertices of square $RSTV$ have coordinates $R(-1,5)$, $S(-3,1)$, $T(-7,3)$, and $V(-5,7)$. What is the perimeter of $RSTV$?

1) $\sqrt{20}$
2) $\sqrt{40}$
3) $4\sqrt{20}$
4) $4\sqrt{40}$

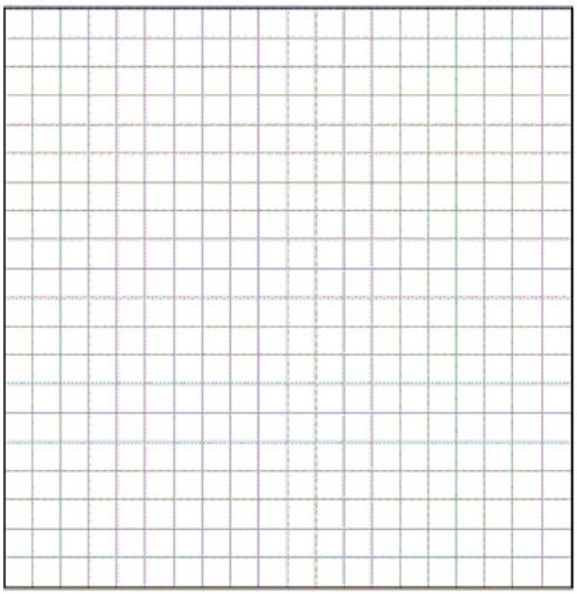
4 Rhombus $STAR$ has vertices $S(-1,2)$, $T(2,3)$, $A(3,0)$, and $R(0,-1)$. What is the perimeter of rhombus $STAR$?

1) $\sqrt{34}$
2) $4\sqrt{34}$
3) $\sqrt{10}$
4) $4\sqrt{10}$

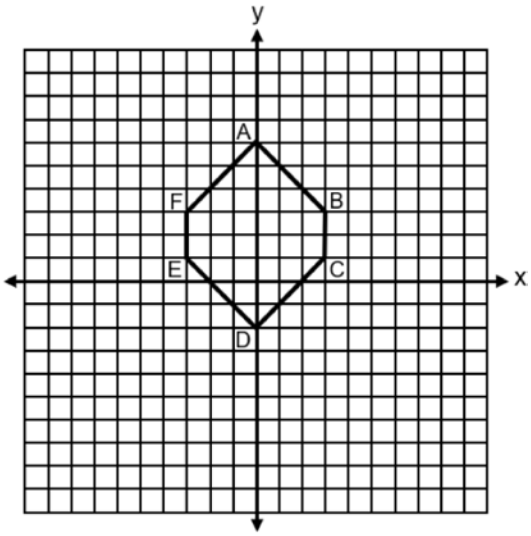
5 The endpoints of one side of a regular pentagon are $(-1,4)$ and $(2,3)$. What is the perimeter of the pentagon?

1) $\sqrt{10}$
2) $5\sqrt{10}$
3) $5\sqrt{2}$
4) $25\sqrt{2}$

6 Triangle ABC has coordinates $A(-6,2)$, $B(-3,6)$, and $C(5,0)$. Find the perimeter of the triangle. Express your answer in simplest radical form. [The use of the grid below is optional.]

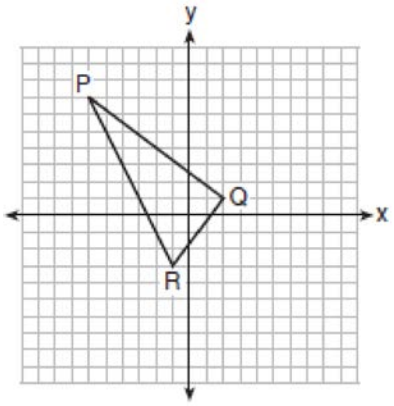


7 Hexagon $ABCDEF$ with coordinates at $A(0,6)$, $B(3,3)$, $C(3,1)$, $D(0,-2)$, $E(-3,1)$, and $F(-3,3)$ is graphed on the set of axes below.



Determine and state the perimeter of $ABCDEF$ in simplest radical form.

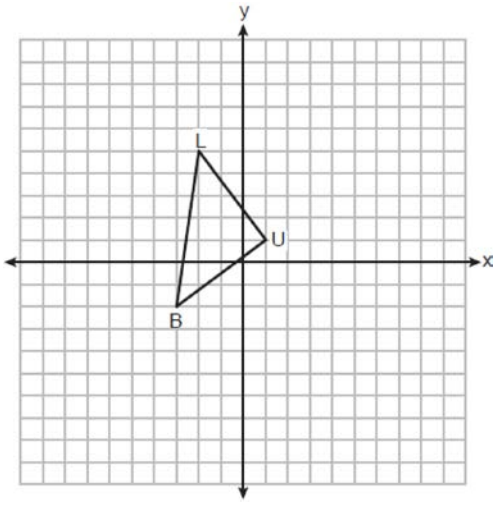
8 On the set of axes below, the vertices of $\triangle PQR$ have coordinates $P(-6,7)$, $Q(2,1)$, and $R(-1,-3)$.



What is the area of $\triangle PQR$?

1) 10
2) 20
3) 25
4) 50

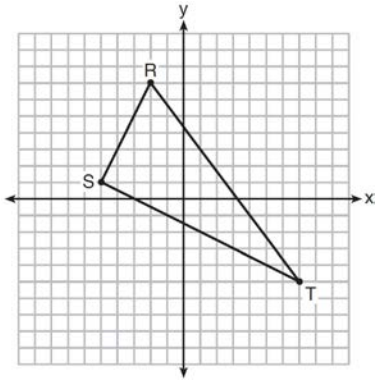
9 On the set of axes below, $\triangle BLU$ has vertices with coordinates $B(-3,-2)$, $L(-2,5)$, and $U(1,1)$.



What is the area of $\triangle BLU$?

1) 11
2) 12.5
3) 14
4) 17.1

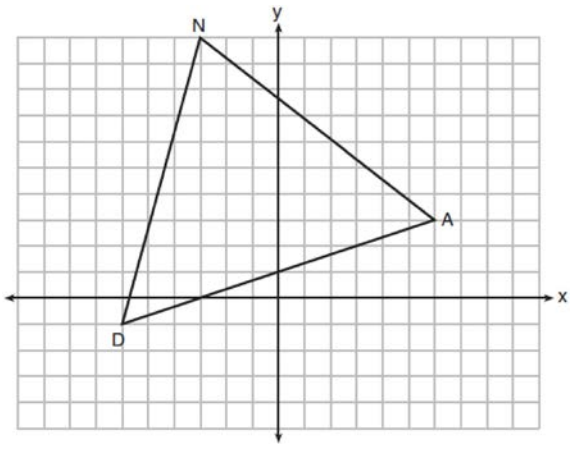
10 Triangle RST is graphed on the set of axes below.



How many square units are in the area of $\triangle RST$?

1) $9\sqrt{3}+15$
2) $9\sqrt{5}+15$
3) 45
4) 90

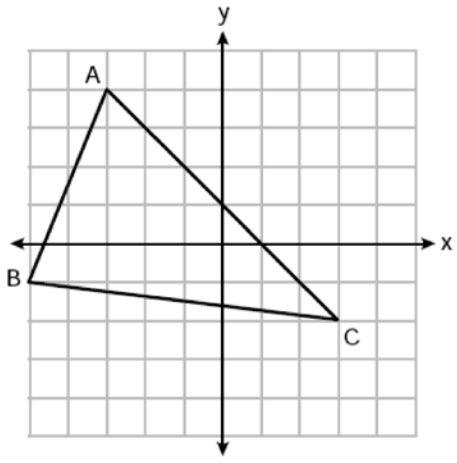
11 Triangle DAN is graphed on the set of axes below. The vertices of $\triangle DAN$ have coordinates $D(-6,-1)$, $A(6,3)$, and $N(-3,10)$.



What is the area of $\triangle DAN$?

1) 60
2) 120
3) $20\sqrt{13}$
4) $40\sqrt{13}$

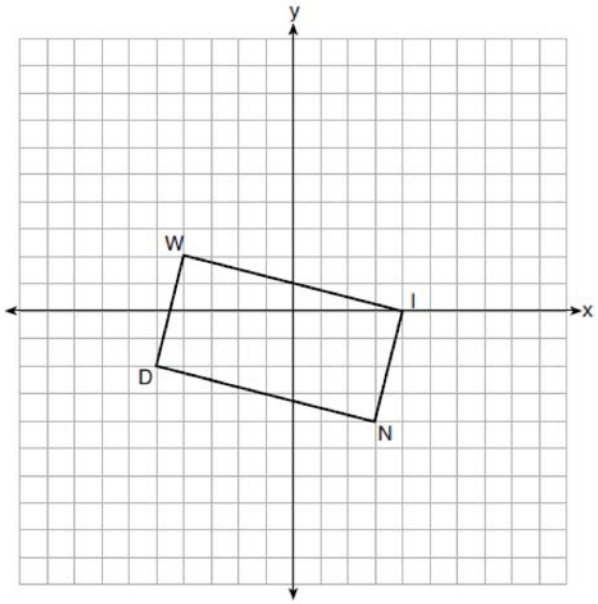
12 Triangle ABC is graphed on the set of axes below. The vertices of $\triangle ABC$ have coordinates $A(-3,4)$, $B(-5,-1)$, and $C(3,-2)$.



What is the area of $\triangle ABC$?

1) 16
2) 20
3) 21
4) 24

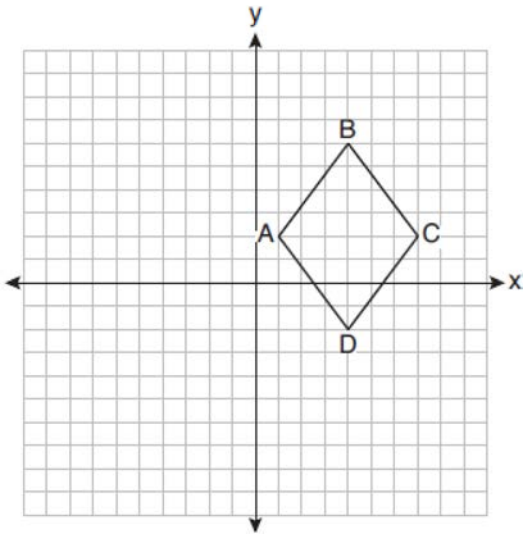
13 On the set of axes below, rectangle $WIND$ has vertices with coordinates $W(-4,2)$, $I(4,0)$, $N(3,-4)$, and $D(-5,-2)$.



What is the area of rectangle $WIND$?

1) 17
2) 31
3) 32
4) 34

14 On the set of axes below, rhombus $ABCD$ has vertices whose coordinates are $A(1,2)$, $B(4,6)$, $C(7,2)$, and $D(4,-2)$.



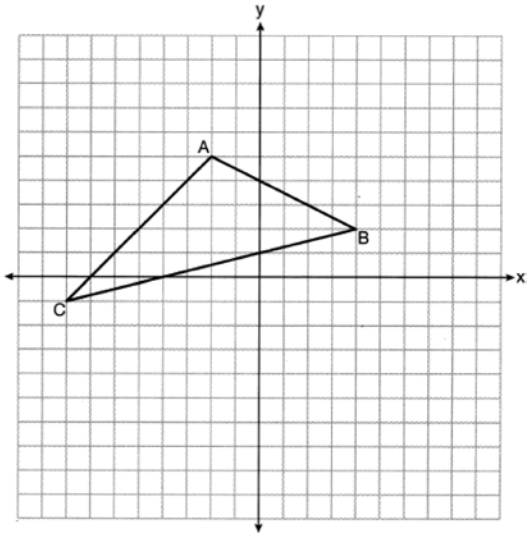
What is the area of rhombus $ABCD$?

1) 20
2) 24
3) 25
4) 48

15 The coordinates of vertices A and B of $\triangle ABC$ are $A(3,4)$ and $B(3,12)$. If the area of $\triangle ABC$ is 24 square units, what could be the coordinates of point C?

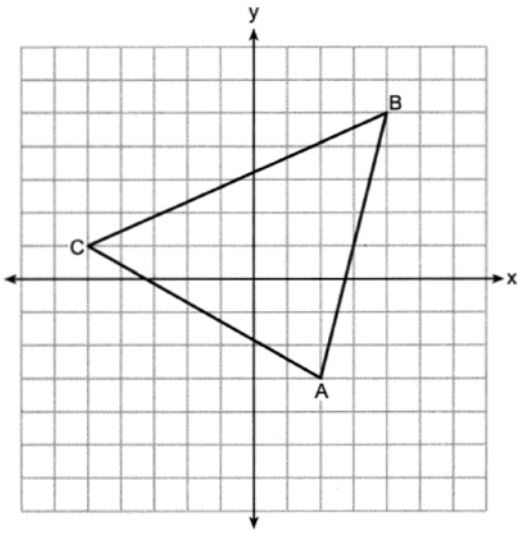
1) $(3,6)$
2) $(8,-3)$
3) $(-3,8)$
4) $(6,3)$

16 Triangle ABC with coordinates $A(-2,5)$, $B(4,2)$, and $C(-8,-1)$ is graphed on the set of axes below.



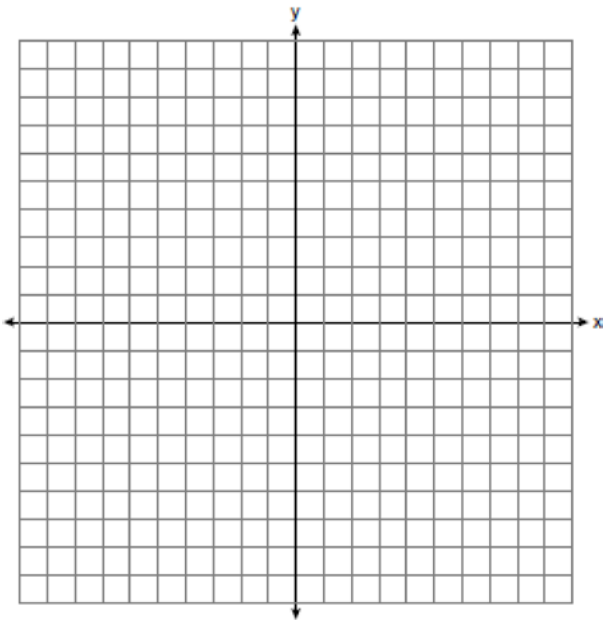
Determine and state the area of $\triangle ABC$.

17 On the set of axes below, $\triangle ABC$ is drawn with vertices that have coordinates $A(2,-3)$, $B(4,5)$, and $C(-5,1)$.

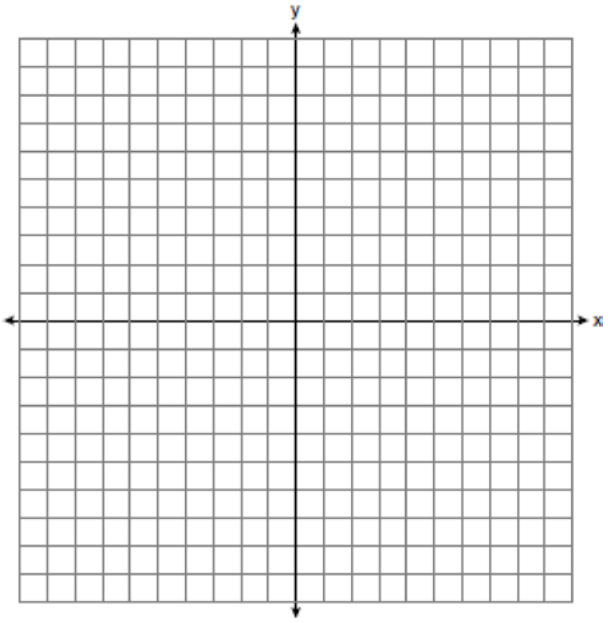


Determine and state the area of $\triangle ABC$.

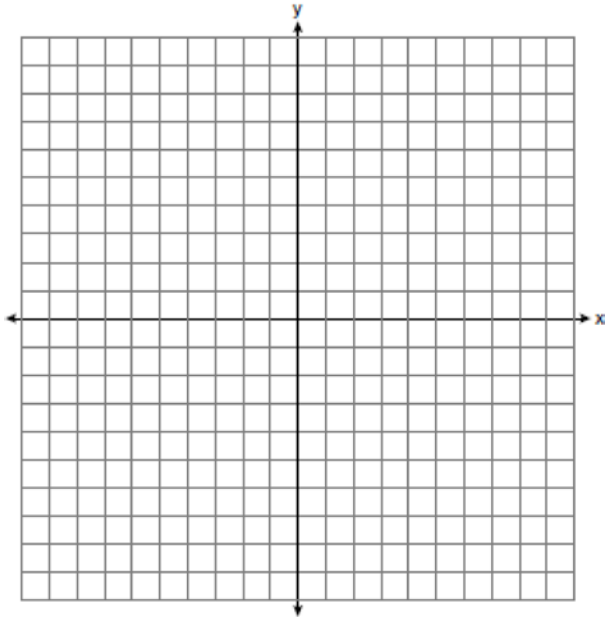
18 The vertices of $\triangle ABC$ have coordinates $A(-2,-1)$, $B(10,-1)$, and $C(4,4)$. Determine and state the area of $\triangle ABC$. [The use of the set of axes below is optional.]



19 Determine and state the area of triangle PQR, whose vertices have coordinates $P(-2,-5)$, $Q(3,5)$, and $R(6,1)$. [The use of the set of axes below is optional.]



20 Triangle MAX has vertices with coordinates $M(-5,-2)$, $A(1,4)$, and $X(4,1)$. Determine and state the area of $\triangle MAX$. [The use of the set of axes below is optional.]



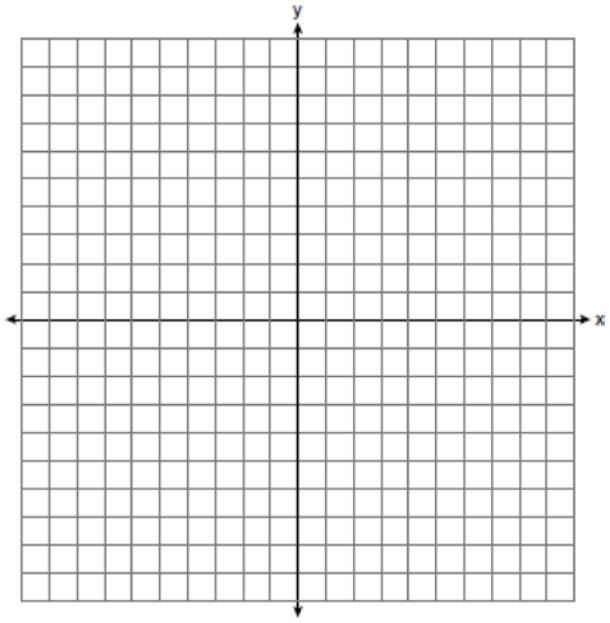
21 On the accompanying set of axes, graph and label the following lines:

$$y = 5$$

$$x = -4$$

$$y = \frac{5}{4}x + 5$$

Calculate the area, in square units, of the triangle formed by the three points of intersection.



G.GPE.B.7: Polygons in the Coordinate Plane
Answer Section

1 ANS:
$\sqrt{(7-3)^2+(-8-0)^2} = \sqrt{16+64} = \sqrt{80} = 4\sqrt{5}$

REF: 061331ge

2 ANS: 2
$\sqrt{(-2-4)^2+(-3-(-1))^2} = \sqrt{40} = \sqrt{4}\sqrt{10} = 2\sqrt{10}$

REF: 011313ge

3 ANS: 3
$4\sqrt{(-1--3)^2+(5-1)^2} = 4\sqrt{20}$

REF: 081703geo

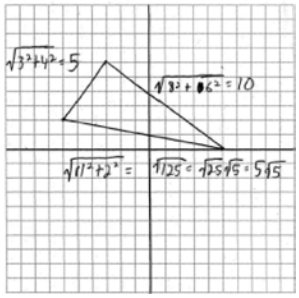
4 ANS: 4
$4\sqrt{(-1-2)^2+(2-3)^2} = 4\sqrt{10}$

REF: 081808geo

5 ANS: 2
$\sqrt{(-1-2)^2+(4-3)^2} = \sqrt{10}$

REF: 011615geo

6 ANS:



$15+5\sqrt{5}$.

REF: 060936ge

7 ANS:
$4\sqrt{3^2+3^2}+2(2) = 4\sqrt{18}+4 = 12\sqrt{2}+4$

REF: spr2408geo

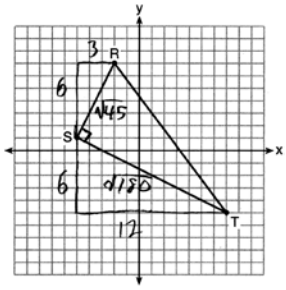
8 ANS: 3 REF: 061702geo

9 ANS: 2

$7 \times 4 - \frac{1}{2}\left((7)(1) + (3)(4) + (4)(3)\right) = 28 - \frac{7}{2} - 6 - 6 = 12.5$

REF: 012407geo

10 ANS: 3

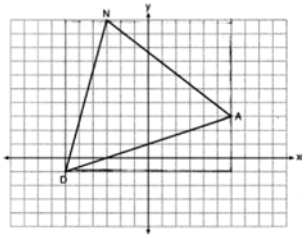


$\sqrt{45} = 3\sqrt{5} \quad a = \frac{1}{2}\left(3\sqrt{5}\right)\left(6\sqrt{5}\right) = \frac{1}{2}(18)(5) = 45$

$\sqrt{180} = 6\sqrt{5}$

REF: 061622geo

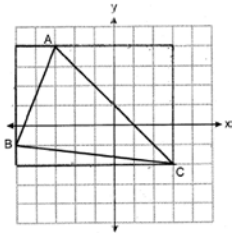
11 ANS: 1



$(12 \cdot 11) - \left(\frac{1}{2}(12 \cdot 4) + \frac{1}{2}(7 \cdot 9) + \frac{1}{2}(11 \cdot 3)\right) = 60$

REF: 061815geo

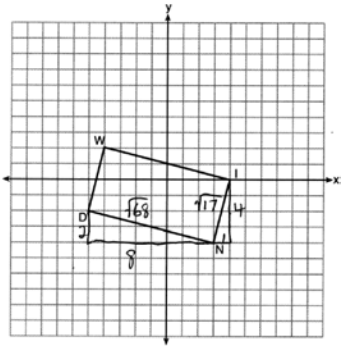
12 ANS: 3



$8 \times 6 - \frac{1}{2}(8 \times 1 + 5 \times 2 + 6 \times 6) = 48 - \frac{1}{2}(54) = 21$

REF: 012511geo

13 ANS: 4



$\sqrt{8^2+2^2} \times \sqrt{4^2+1^2} = \sqrt{68} \times \sqrt{17} = \sqrt{4}\sqrt{17} \times \sqrt{17} = 2 \cdot 17 = 34$

REF: 082214geo

14 ANS: 2

Create two congruent triangles by drawing $\overline{BD}$, which has a length of 8. Each triangle has an area of $\frac{1}{2}(8)(3) = 12$.

REF: 012018geo

15 ANS: 3

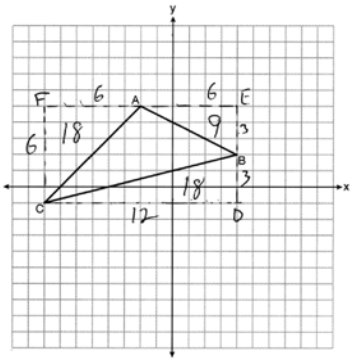
$A = \frac{1}{2}ab \quad 3 - 6 = -3 = x$

$24 = \frac{1}{2}a(8) \quad \frac{4+12}{2} = 8 = y$

$a = 6$

REF: 081615geo

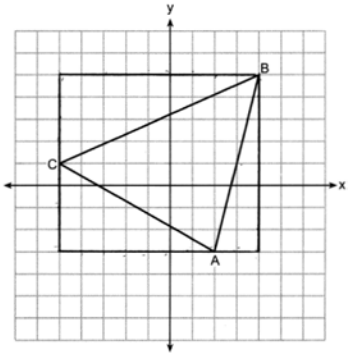
16 ANS:



$6 \times 12 - \frac{1}{2}(12 \times 3) - \frac{1}{2}(6 \times 6) - \frac{1}{2}(6 \times 3) = 27$

REF: 012331geo

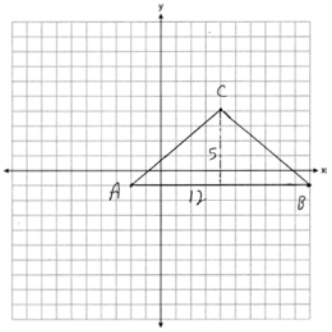
17 ANS:



$9 \times 8 - \frac{1}{2}(4 \times 7) - \frac{1}{2}(4 \times 9) - \frac{1}{2}(8 \times 2) = 32$

REF: 062430geo

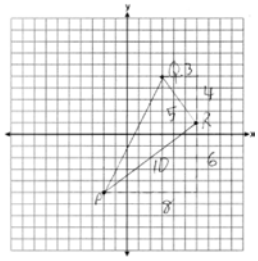
18 ANS:



$\frac{1}{2}(5)(12) = 30$

REF: 081928geo

19 ANS:



$\frac{1}{2}(5)(10) = 25$

REF: 061926geo

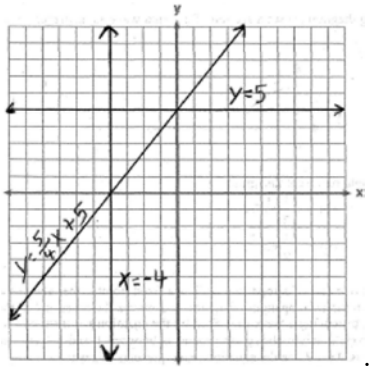
20 ANS:

$m_{\overline{AX}} = \frac{4-1}{1-4} = -1$ $\overline{AM}$ is an altitude. $A = \frac{1}{2}\sqrt{18}\sqrt{72} = \frac{1}{2}\sqrt{9}\sqrt{2}\sqrt{9}\sqrt{8} = 18$

$m_{\overline{AM}} = \frac{4--2}{1--5} = 1$

REF: 082427geo

21 ANS:



. 10. $A = \frac{1}{2}bh = \frac{1}{2} \times 4 \times 5 = 10$

REF: 010335a