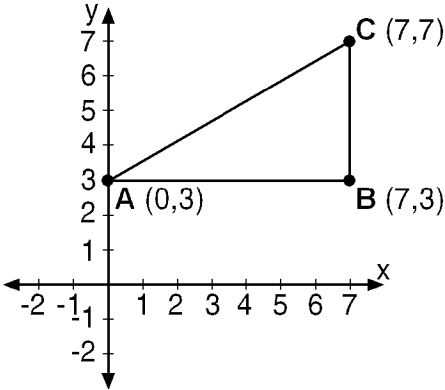Name: _____

CC Geometry Homework

Area and Perimeter in the Coordinate Plane

1) In the accompanying figure, $\triangle ABC$ has coordinates $A(0,3)$, $B(7,3)$, and $C(7,7)$.
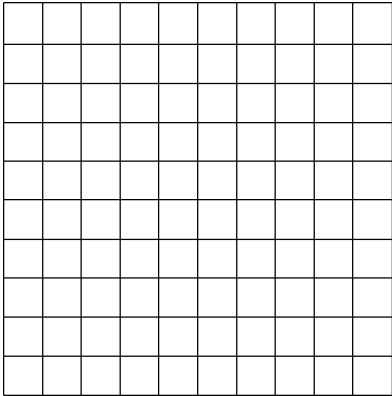

What is the area of $\triangle ABC$ in square units?
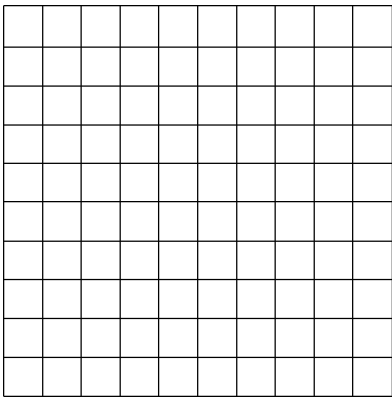
A) 20   C) 16

B) 14   D) 12

2) 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*?

A) $4\sqrt{40}$ C) $\sqrt{20}$
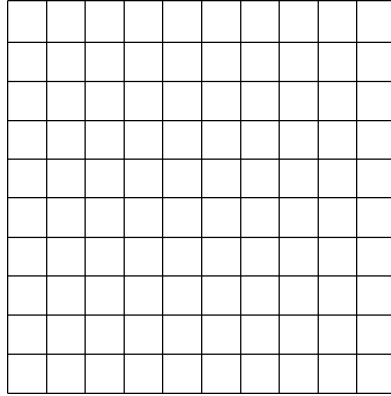
B) $4\sqrt{20}$ D) $\sqrt{40}$

3) Using the coordinate grid below, find the area of a triangle whose vertices are $A(3,4)$, $B(1,-3)$, and $C(-3,-1)$. [*Show all work.*]
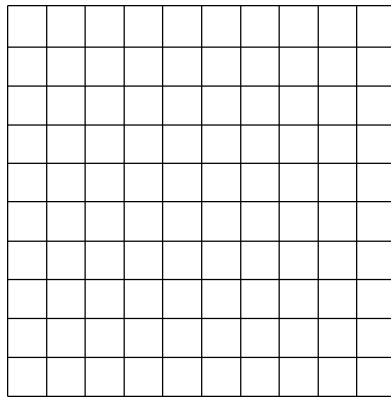

4) Triangle *ABC* has vertices $A(-3,-4)$, $B(-1,6)$ and $C(3,5)$. Using the coordinate grid below, find the area of $\triangle ABC$. [*Show all work.*]

5) Using the coordinate grid below, find the area of quadrilateral *ABCD* with vertices *A*(-4,2), *B*(0,5), *C*(3,3), and *D*(1,-5). [*Show all work.*]
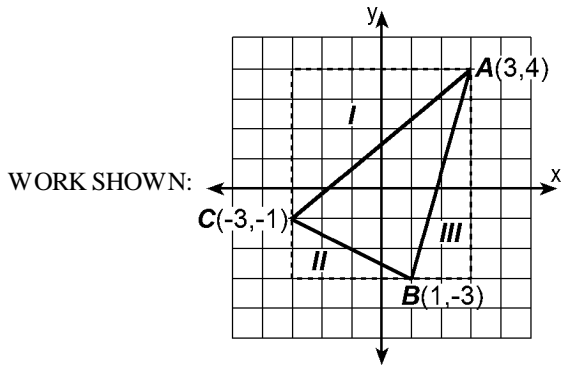
6) Using the coordinate grid below, find the area of pentagon *ABCDE* whose vertices are *A*(-3,-1), *B*(-2,2), *C*(2,2), *D*(1,-1), and *E*(-1,-2). [*Show all work.*]
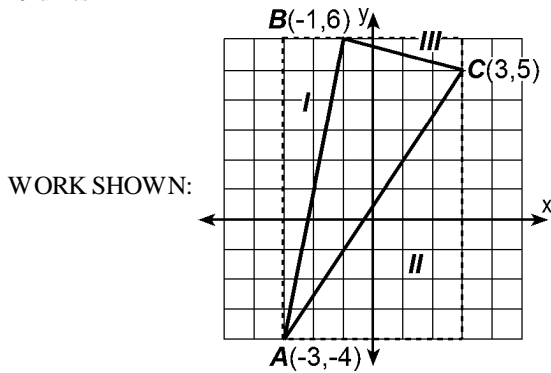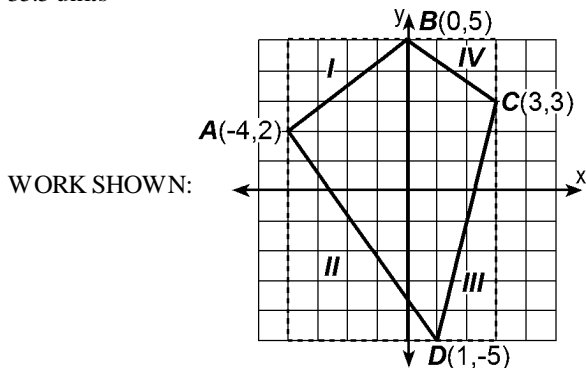
1) B   2) B

3) $16\,\text{units}^2$

$A_{\text{rectangle}} = \ell \times w = (7)(6) = 42$, $A_{\text{triangle}} = \frac{1}{2}bh$: $A_I = \frac{1}{2}(6)(5) = 15$; $A_{II} = \frac{1}{2}(4)(2) = 4$; $A_{III} = \frac{1}{2}(7)(2) = 7$; $A_{\triangle ABC} = A_{\text{rectangle}} - (A_I + A_{II} + A_{III}) = 42 - (15 + 4 + 7) = 16$
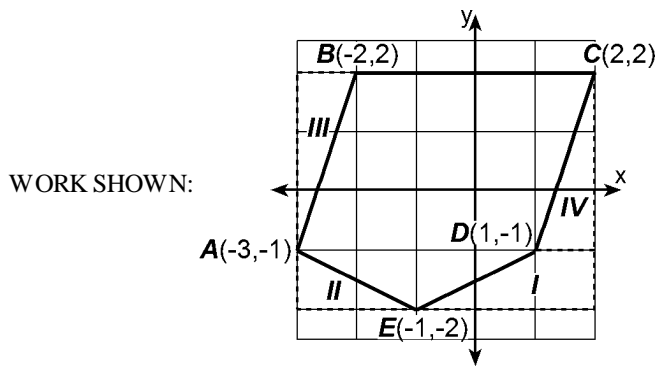
4) $19\,\text{units}^2$

$A_{\text{rectangle}} = \ell \times w = (10)(6) = 60$, $A_{\text{triangle}} = \frac{1}{2}bh$: $A_I = \frac{1}{2}(10)(2) = 10$; $A_{II} = \frac{1}{2}(6)(9) = 27$; $A_{III} = \frac{1}{2}(4)(2) = 4$; $A_{\triangle ABC} = A_{\text{rectangle}} - (A_I + A_{II} + A_{III}) = 60 - (10 + 27 + 4) = 19$

5) $35.5\,\text{units}^2$

$A_{\text{rectangle}} = \ell w = (10)(7) = 70$; $A_{\text{triangle}} = \frac{1}{2}bh$, $A_I = \frac{1}{2}(4)(3) = 6$, $A_{II} = \frac{1}{2}(5)(7) = \frac{35}{2}$, $A_{III} = \frac{1}{2}(2)(8) = 8$, $A_{IV} = \frac{1}{2}(3)(2) = 3$;

$A_{ABCD} = A_{\text{rectangle}} - (A_I + A_{II} + A_{III} + A_{IV}) = 70 - (6 + \frac{35}{2} + 8 + 3) = 35.5$

6) $14\,\text{units}^2$

WORK SHOWN:

$A_{\text{rectangle}} = \ell w = (4)(5) = 20$; $A_I = \frac{1}{2}h(b_1 + b_2) = \frac{1}{2}(1)(1 + 3) = 2$; $A_{\text{triangle}} = \frac{1}{2}bh$, $A_{II} = \frac{1}{2}(2)(1) = 1$, $A_{III} = \frac{1}{2}(1)(3) = \frac{3}{2}$, $A_{IV} = \frac{1}{2}(1)(3) = \frac{3}{2}$;

$A_{ABCDE} = A_{\text{rectangle}} - (A_I + A_{II} + A_{III} + A_{IV}) = 20 - (2 + 1 + \frac{3}{2} + \frac{3}{2}) = 14$