

Test Review Key

① Midpoint : $\left(\frac{-7+2}{2}, \frac{5-4}{2}\right) = \left(\frac{-5}{2}, \frac{1}{2}\right)$

Distance : $d = \sqrt{(-7-2)^2 + (5-(-4))^2} = \sqrt{81 + 81} = \sqrt{162} = 9\sqrt{2}$

Slope : $\frac{-4-5}{2-(-7)} = \frac{-9}{9} = -1$

② $\left(\frac{24+x}{2}, \frac{y-16}{2}\right) = (-13, 8)$

$$\frac{24+x}{2} = -13$$

$$\frac{y-16}{2} = 8$$

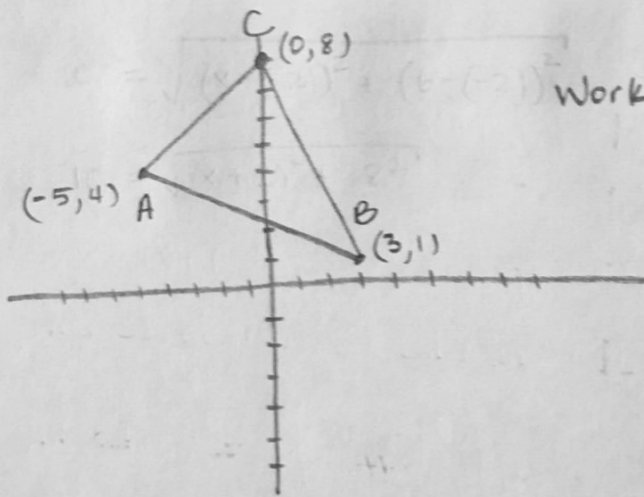
$$24+x = -26$$

$$y-16 = 16$$

$$x = -50$$

$$y = 32$$

③ a) $d = \sqrt{(x-(-5))^2 + (y-4)^2}$ Work on separate sheet.



④ on separate sheet

⑤ on separate sheet

⑥ a) $(x-4)^2 + (y+5)^2 = 18$

b) $r = \sqrt{(-7-1)^2 + (2-(-4))^2} = \sqrt{64+36}$
 $= \sqrt{100} = 10$

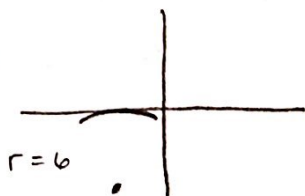
$(x+7)^2 + (y-2)^2 = 100$

c) center = $(\frac{1-5}{2}, \frac{-9-1}{2}) = (-\frac{4}{2}, \frac{-10}{2}) = (-2, -5)$

$r = \sqrt{(1-(-2))^2 + (-9-(-5))^2} = \sqrt{9+16} = \sqrt{25} = 5$

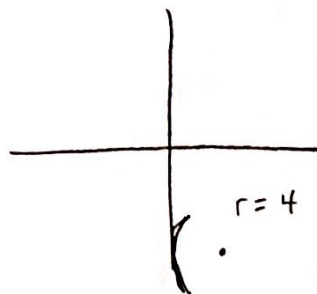
$(x+2)^2 + (y+5)^2 = 25$

d)



$(x+3)^2 + (y+6)^2 = 36$

e)



$(x-4)^2 + (y+7)^2 = 16$

⑦

a) C(4,2) r=4

b) C(-2,7) r = $\sqrt{24} = 2\sqrt{6}$

c) $x^2 + y^2 - 4x - 8y - 5 = 0$

$x^2 - 4x + \frac{4}{4} + y^2 - 8y + \frac{16}{4} = 5 + \frac{4}{4} + \frac{16}{4}$

$(x-2)^2 + (y-4)^2 = 25$

C(2,4) r=5

d) $x^2 + y^2 + 14x + 16y - 8 = 0$

$x^2 + 14x + \frac{49}{4} + y^2 + 16y + \frac{64}{4} = 8 + \frac{49}{4} + \frac{64}{4}$

$(x+7)^2 + (y+8)^2 = 121$

C(-7, -8) r=11

8 a) SF: $\frac{2}{2+3} = \frac{2}{5}$

Horiz
 $5 - (-2) = 7$
 SF: $7(\frac{2}{5}) = \frac{14}{5}$
 orig x + $\frac{14}{5} = -2 + \frac{14}{5} = \boxed{\frac{4}{5}}$

Vert
 $-4 - 1 = -5$
 SF: $-5(\frac{2}{5}) = -2$
 orig y - 2 = $1 - 2 = \boxed{-1}$

b) SF: $\frac{3}{3+4} = \frac{3}{7}$

Horiz
 $-4 - 0 = -4$
 SF: $-4(\frac{3}{7}) = -\frac{12}{7}$
 orig x - $\frac{12}{7} = 0 - \frac{12}{7} = \boxed{-\frac{12}{7}}$

Vert
 $2 - (-2) = 4$
 SF: $4(\frac{3}{7}) = \frac{12}{7}$
 orig y + $\frac{12}{7} = -2 + \frac{12}{7} = \boxed{-\frac{2}{7}}$

9 a) slope = $\frac{2}{5}$ (-2, 5)

$5 = \frac{2}{5}(-2) + b$
 $5 = -\frac{4}{5} + b$
 $5 + \frac{4}{5} = b$
 $\frac{29}{5} = b$

$y = \frac{2}{5}x + \frac{29}{5}$

b) slope = $\frac{2}{5}$ (4, -5)

$-5 = \frac{2}{5}(4) + b$
 $-5 = \frac{8}{5} + b$
 $-5 - \frac{8}{5} = b$
 $-\frac{33}{5} = b$

$y = \frac{2}{5}x - \frac{33}{5}$

c) slope = $\frac{-2-3}{0-(-1)} = \frac{-5}{1} = -5$

$3 = -5(-2) + b$
 $3 = 10 + b$
 $3 - 10 = b$
 $-7 = b$

$y = -5x - 7$

d) slope = $\frac{0-2}{-4-1} = \frac{-2}{-5} = \frac{2}{5}$

\perp slope = $-\frac{5}{2}$

$0 = -\frac{5}{2}(-5) + b$
 $0 = \frac{25}{2} + b$
 $-\frac{25}{2} = b$

$y = -\frac{5}{2}x - \frac{25}{2}$

10 a) C(3, -2) point (-3, 4)

$$\text{slope of radius} = \frac{4 - (-2)}{-3 - 3} = \frac{6}{-6} = -1$$

$$\text{slope of tangent} = 1$$

$$4 = (1)(-3) + b$$

$$4 = -3 + b$$

$$7 = b$$

$$\boxed{y = x + 7}$$

b) C(0, -12) point (-6, -1)

$$\text{slope of radius} = \frac{-1 + 12}{-6 - 0} = \frac{11}{-6}$$

$$\text{slope of tangent} = 6/11$$

$$-1 = \left(\frac{6}{11}\right)(-6) + b$$

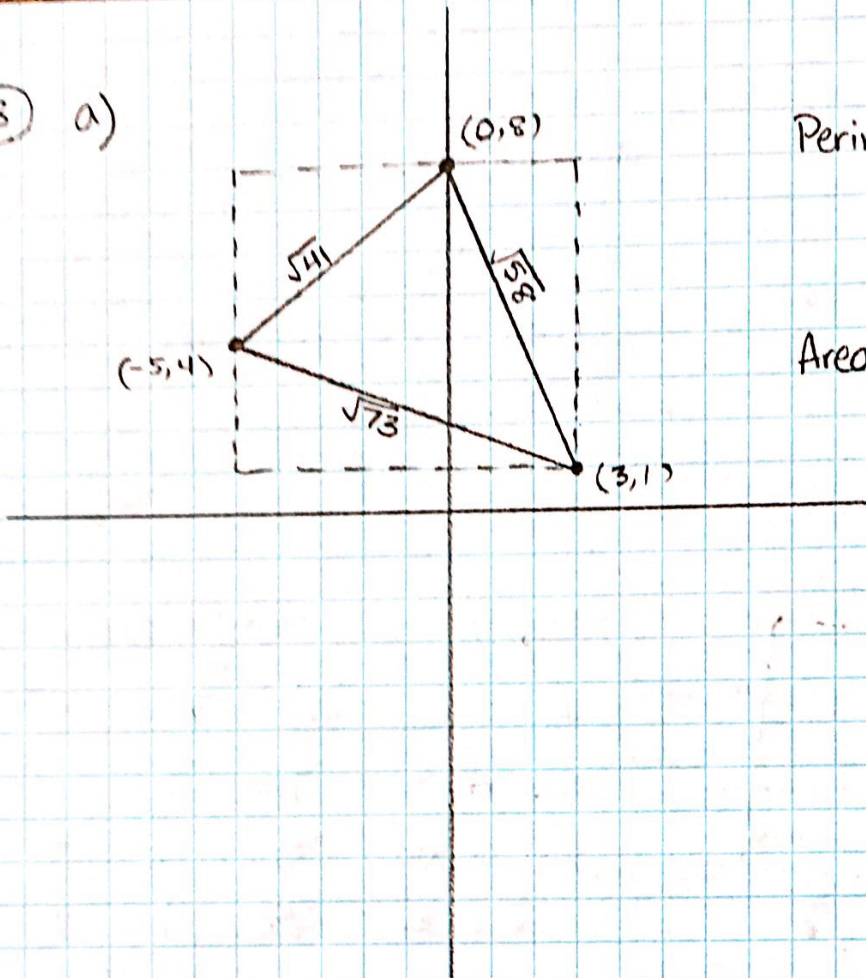
$$-1 = -\frac{36}{11} + b$$

$$-1 + \frac{36}{11} = b$$

$$\frac{25}{11} = b$$

$$\boxed{y = \frac{6}{11}x + \frac{25}{11}}$$

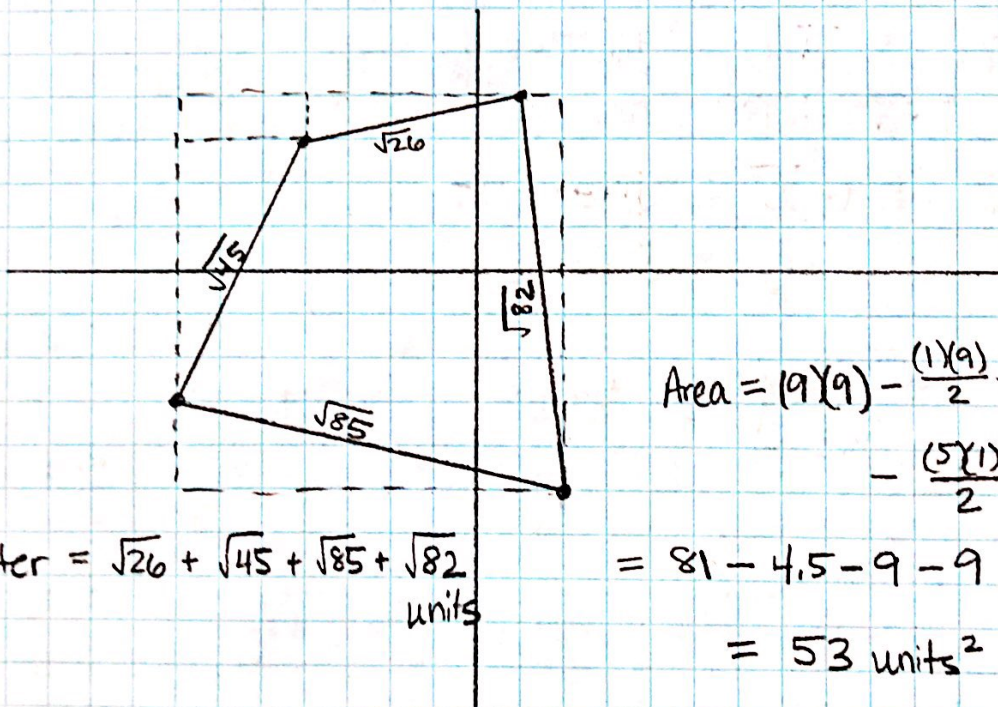
3 a)



$$\begin{aligned} \text{Perimeter} &= \sqrt{41} + \sqrt{58} + \sqrt{73} \\ &= 22.56 \text{ units} \end{aligned}$$

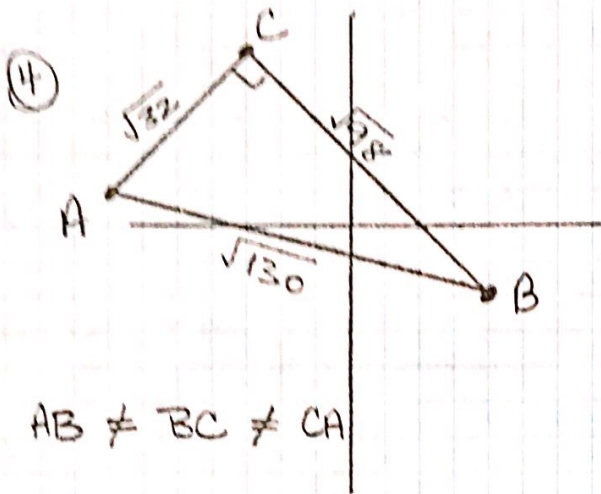
$$\begin{aligned} \text{Area} &= (8 \times 7) - \frac{(8 \times 3)}{2} - \frac{(4 \times 5)}{2} - \frac{(7 \times 3)}{2} \\ &= 56 - 12 - 10 - 10.5 \\ &= 23.5 \text{ units}^2 \end{aligned}$$

b)



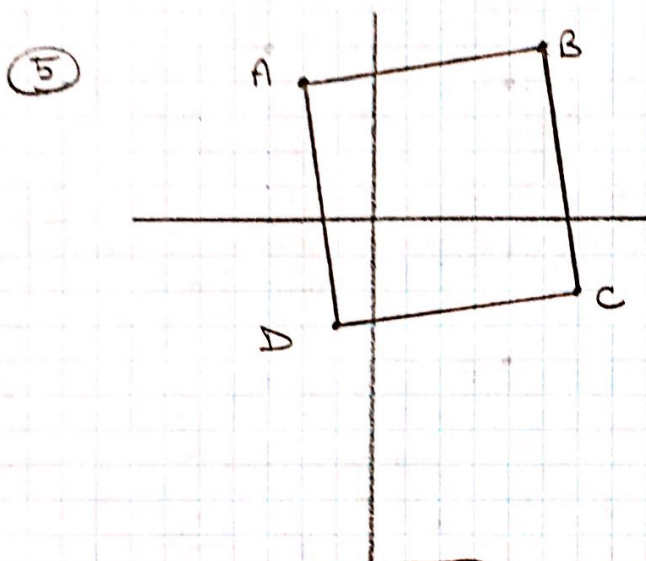
$$\text{Perimeter} = \sqrt{26} + \sqrt{45} + \sqrt{85} + \sqrt{82} \text{ units}$$

$$\begin{aligned} \text{Area} &= (9 \times 9) - \frac{(1 \times 9)}{2} - \frac{(9 \times 2)}{2} - \frac{(6 \times 3)}{2} \\ &\quad - \frac{(5 \times 1)}{2} - (3 \times 1) \\ &= 81 - 4.5 - 9 - 9 - 2.5 - 3 \\ &= 53 \text{ units}^2 \end{aligned}$$



slope of AC = 1
 slope of CB = -1

AC \perp CB
 $\triangle ABC$ is a right \triangle
 $\triangle ABC$ is scalene



Show that it's a parallelogram first.

slope of AB = $\frac{5-4}{5+2} = \frac{1}{7}$

slope of DC = $\frac{-3+2}{-1-6} = \frac{-1}{-7} = \frac{1}{7}$

slope of AD = $\frac{-3-4}{-1+2} = \frac{-7}{1} = -7$

slope of BC = $\frac{-2-5}{6-5} = \frac{-7}{1} = -7$

AB \parallel DC, AD \parallel BC so figure is parallelogram

AB = $\sqrt{(-2-5)^2 + (4-5)^2} = \sqrt{49+1} = \sqrt{50}$

DC = $\sqrt{(6+1)^2 + (-2+3)^2} = \sqrt{49+1} = \sqrt{50}$

AD = $\sqrt{(-2+1)^2 + (4+3)^2} = \sqrt{1+49} = \sqrt{50}$

BC = $\sqrt{(5-6)^2 + (5+2)^2} = \sqrt{1+49} = \sqrt{50}$

All sides \cong
 AB \perp BC } the figure is a square