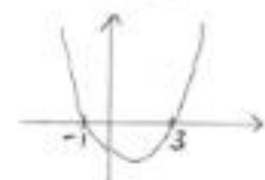


Higher HW1

1a. $x^2+10x+16 = \underline{(x+5)^2-9}$ b. $x^2-6x-2 = \underline{(x-3)^2-11}$ c. $x^2+x-6 = \underline{(x+\frac{1}{2})^2-6\frac{1}{4}}$ d. $x^2-3x-7 = \underline{(x-\frac{3}{2})^2-9\frac{1}{4}}$

2a. $x^2-2x-3=0$
 $(x+1)(x-3)=0$
 $x=-1, x=3$



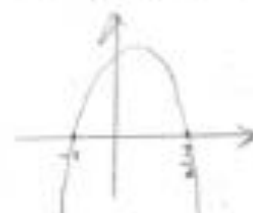
$x^2-2x-3 \geq 0$
 when
 $x \leq -1$ and
 $x \geq 3$

b. $5x^2-80=0$
 $5(x^2-16)=0$
 $5(x-4)(x+4)=0$
 $x=4, x=-4$



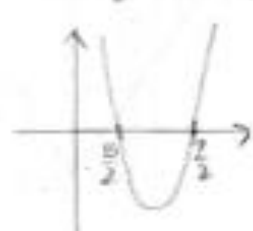
$5x^2-80 > 0$
 when
 $x < -4$ and
 $x > 4$

c. $-2x^2+x+3=0$
 $(-2x+3)(x+1)=0$
 $x=\frac{3}{2}$ or $x=-1$



$-2x^2+x+3 < 0$
 when
 $x < -1$ and
 $x > \frac{3}{2}$

d. $4x^2-24x+35=0$
 $(2x-5)(2x-7)=0$
 $x=\frac{5}{2}$ or $x=\frac{7}{2}$



$4x^2-24x+35 \geq 0$
 when
 $x \leq \frac{5}{2}$ and
 $x \geq \frac{7}{2}$

3.

 a. $m_{DF} = \frac{-3+7}{9-1}$
 $= \frac{4}{8}$
 $= \frac{1}{2}$
 $m_{\perp} = -2$

$y-3 = -2(x-3)$
 $y-3 = -2x+6$
 $y = -2x+9$

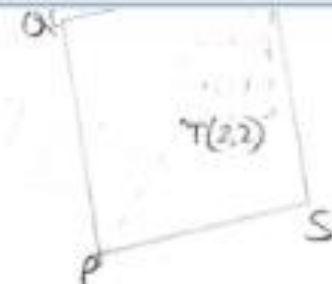
b. $(\frac{3+9}{2}, \frac{3+3}{2}) = (6, 0)$
 $m_{DF} = \frac{-3-3}{9-3}$
 $= \frac{-6}{6}$
 $= -1$
 $m_{\perp} = 1$

$y-0 = 1(x-6)$
 $y = x-6$

c. $-2x+9 = x-6$
 $9 = 3x-6$
 $15 = 3x$
 $x = 5$
 $y = 5-6$
 $y = -1$
 $(5, -1)$

4. i) $m_{PR} = 2$ $y-4 = \frac{1}{2}(x+2)$ ii) $2y = -x+6$ ①
 $m_{QS} = -\frac{1}{2}$ $2y-8 = -x-2$ $y = 2x-2$ ②
 $2y = -x+6$ \times ① by 2
 $4y = -2x+12$

Add
 $5y = 10$
 $y = 2$
 Place $y=2$ into ②



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

$$5+x = 4$$

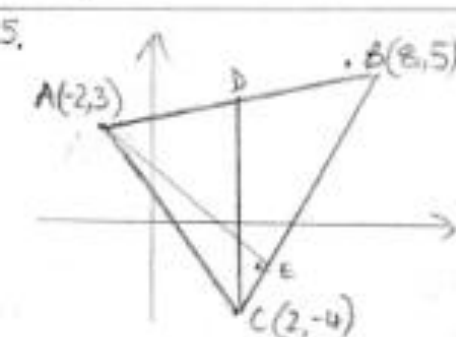
$$x = -1$$

$$\frac{8+y}{2} = 2$$

$$8+y = 4$$

$$y = -4$$

$$\underline{\underline{P(-1, -4)}}$$



a. $(\frac{-2+8}{2}, \frac{3+5}{2})$

$$= (3, 4)$$

$$m_{CE} = \frac{-4-4}{2-3}$$

$$= \frac{-8}{-1}$$

$$= 8$$

$$y+4 = 8(x-7)$$

$$y+4 = 8x-16$$

$$\underline{\underline{y = 8x-20}}$$

b. $m_{CB} = \frac{-4-5}{2-8}$

$$= \frac{-9}{-6}$$

$$= \frac{3}{2}$$

$$m_{AE} = \frac{-2}{3}$$

$$y-3 = \frac{-2}{3}(x+2)$$

$$3y-9 = -2x-4$$

$$\underline{\underline{3y = -2x+5}}$$

c. $y = 8x-20$ ①

$$3y = -2x+5$$
 ②

x ② by 4

$$y = 8x-20$$

$$12y = -8x+20$$

$$3y = 0$$

$$y = 0$$

Place $y=0$ into

$$8x-20=0$$

$$8x=20$$

$$x = \frac{5}{2}$$

$$\underline{\underline{(\frac{5}{2}, 0)}}$$

6. $m = \tan \theta$

$$m = \tan 135$$

$$= -1$$

$$y-3 = -1(x+8)$$

$$y-3 = -x-8$$

$$\underline{\underline{y = -x-5}}$$

7. $a^2 = b^2 + c^2 - (2bc \cos A)$

$$= 17^2 + 24^2 - (2 \times 17 \times 24 \times \cos 143)$$

$$= 886.33 - (-667.60)$$

$$= 1553.93$$

$$a = \sqrt{1553.93}$$

$$= 39.42 \text{ cm}$$

$$P = 39.42 + 17.2 + 24 \cdot 3$$

$$= 80.92 \text{ cm}$$