

Solutions EXAM I

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① B

② C since they are corresponding angles

③ D

④ A $\angle 5 = \angle 1 = 130^\circ$
 $\angle 7 = 180 - \angle 5$
 $= 180 - 130$
 $= 50^\circ$

⑤ FREE

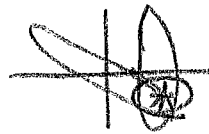
⑥ D

⑦ D

⑧ D

⑨ D

⑩ A



II. ⑪ $\alpha = \beta$

$$\Rightarrow 2x - 9 = x + 33$$

$$\Rightarrow x - 9 = 33$$

$$\Rightarrow x = 42$$

$$\text{so } \alpha = 2(42) - 9 = 84 - 9 = \boxed{75^\circ}$$

$$\beta = (42) + 33 = \boxed{75^\circ}$$

⑫ $\gamma = \alpha + \beta$

$$\Rightarrow 5x + 20 = 2x + 4x \quad \text{so}$$

$$\Rightarrow 5x + 20 = 6x$$

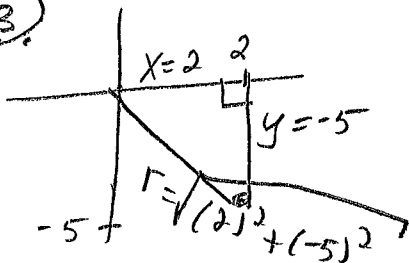
$$\Rightarrow 20 = x$$

$$\alpha = 2(20) = \boxed{40^\circ}$$

$$\beta = 4(20) = \boxed{80^\circ}$$

$$\gamma = 5(20) + 20 = \boxed{120^\circ}$$

⑬



$$r = \sqrt{(2)^2 + (-5)^2}$$

$$= \sqrt{4 + 25}$$

$$= \sqrt{29}$$

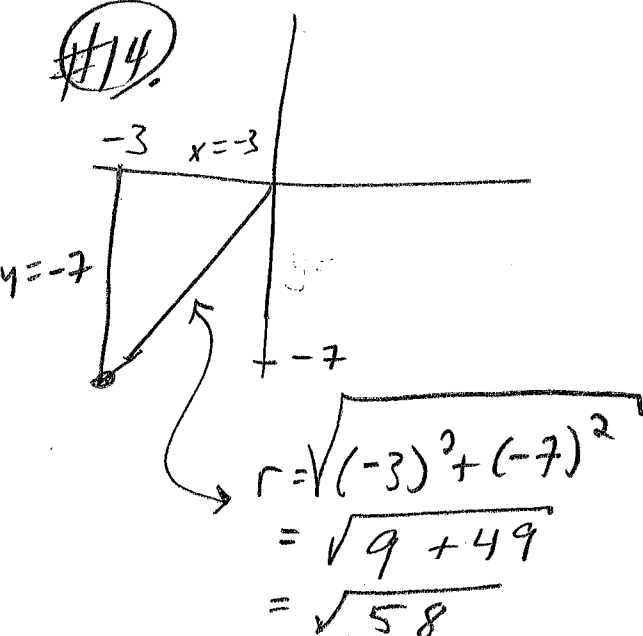
so

$$\sin(\theta) = \frac{-5}{\sqrt{29}} \quad \csc(\theta) = \frac{\sqrt{29}}{-5}$$

$$\cos(\theta) = \frac{2}{\sqrt{29}} \quad \sec(\theta) = \frac{\sqrt{29}}{2}$$

$$\tan(\theta) = \frac{-5}{2} \quad \cot(\theta) = -\frac{2}{5}$$

#14.



so

$$\sin(\theta) = \frac{-7}{\sqrt{58}}$$

$$\cos(\theta) = \frac{-3}{\sqrt{58}}$$

$$\tan(\theta) = \frac{-7}{-3} = \frac{7}{3}$$

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III

⊕ start with the more complicated side⊕ WRITE IT DOWN

← many omitted this step.

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$$\frac{1}{\csc(\theta)} = \frac{1}{\frac{r}{y}}$$

$$= 1 \cdot \frac{y}{r}$$

$$= \frac{y}{r}$$

$$= \sin(\theta) \leftarrow$$

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$$\frac{\csc(\theta)}{\sec(\theta)} = \frac{\frac{r}{y}}{\frac{r}{x}}$$

$$= \frac{r}{y} \cdot \frac{x}{r}$$

$$= \frac{x}{y}$$

$$= \cot(\theta) \leftarrow$$

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$$\frac{\sec(\theta)}{\tan(\theta)} = \frac{\frac{r}{x}}{\frac{y}{x}}$$

$$= \frac{r}{x} \cdot \frac{x}{y}$$

$$= \frac{r}{y}$$

$$= \csc(\theta) \leftarrow$$