SOLUTIONS
Practice EXAM I

I

① C	④ B	⑦ C
② A	⑤ B	⑧ D
③ E	⑥ C	⑨ D
		⑩ C

II

⑪ The angles are alternate exterior

So $\alpha = \beta$

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

$\Rightarrow -x \quad -x$

$x - 9 = 33$

$+9 \quad +9$

$\Rightarrow x = 42$

So $\alpha = 2(42) - 9$

$= 84 - 9$

$= \boxed{75^\circ}$

$\beta = 42 + 33$

$= \boxed{75^\circ}$

⑫ an exterior angle equals the sum of the remote interior angles.

So $\gamma = \alpha + \beta$

$\Rightarrow 5x + 20 = (2x) + (4x)$

$\Rightarrow 5x + 20 = 6x$

$-5x \quad -5x$

$\Rightarrow 20 = x$

So we have

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

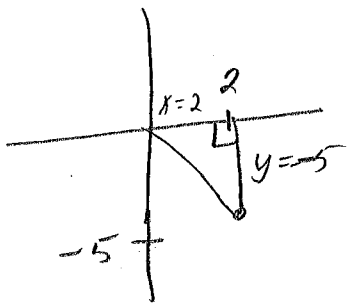
$\beta = 4(20) = \boxed{80^\circ}$

$\gamma = 5(20) + 20$

$= 100 + 20$

$= \boxed{120^\circ}$

(11) (13)



$r = \sqrt{(x)^2 + (y)^2}$

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

$= \sqrt{4 + 25}$

$= \sqrt{29}$

so $x = 2$

$y = -5$

$r = \sqrt{29}$

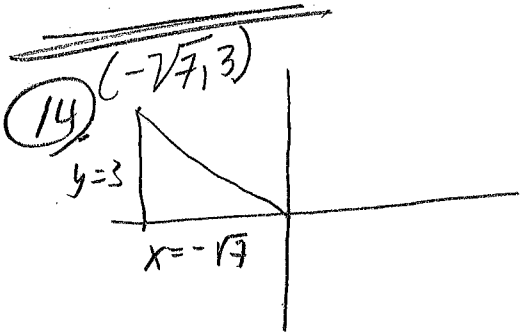
So we have:

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

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

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

(14)



$r = \sqrt{(x)^2 + (y)^2}$

$= \sqrt{(-\sqrt{7})^2 + (3)^2}$

$= \sqrt{7 + 9}$

$= \sqrt{16}$

$= 4$

so $x = -\sqrt{7}$

$y = 3$

$r = 4$

So we have:

$\sin(\theta) = \frac{y}{r} = \boxed{\frac{3}{4}}$ $\quad \csc(\theta) = \frac{r}{y} = \boxed{\frac{4}{3}}$

$\cos(\theta) = \frac{x}{r} = \boxed{\frac{-\sqrt{7}}{4}}$ $\quad \sec(\theta) = \frac{r}{x} = \boxed{\frac{4}{-\sqrt{7}}}$

$\tan(\theta) = \frac{y}{x} = \boxed{\frac{4}{-\sqrt{7}}}$ $\quad \cot(\theta) = \frac{x}{y} = \boxed{\frac{-\sqrt{7}}{4}}$

III

(15) Prove $\cos(\theta) = \frac{1}{\sec(\theta)}$

$$\frac{1}{\sec(\theta)} = \frac{1}{\frac{r}{x}}$$

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

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

$$= \cos(\theta) \checkmark$$

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(16) Prove $\tan(\theta) = \frac{\sec(\theta)}{\csc(\theta)}$

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

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

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

$$= \tan(\theta) \checkmark$$

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(17) Prove: $\sin(\theta) = \frac{\tan(\theta)}{\sec(\theta)}$

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

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

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

$$= \sin(\theta) \checkmark$$

Alternate:

$$\frac{\tan(\theta)}{\sec(\theta)} = \frac{\frac{\sin(\theta)}{\cos(\theta)}}{\frac{1}{\cos(\theta)}}$$

$$= \frac{\sin(\theta)}{\cos(\theta)} \cdot \frac{\cos(\theta)}{1}$$

$$= \frac{\sin(\theta)}{1}$$

$$= \sin(\theta) \checkmark$$