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QUESTION 1:

$$1.) \frac{dy}{dx} = (5x^4) + (5x^2) + (3x) - 19$$
$$= 20x^3 + 10x + 3$$

$$2.) \frac{2x^2 - 2x + 5x + 5}{2x^2 + 3x + 5}$$
$$\frac{dy}{dx} = 4x + 3$$

$$3.) y = x^{-6} - \cos 5x$$
$$y' = -6x^{-7} - (-5\sin 5x)$$
$$\frac{dy}{dx} = -6x^{-7} + 5\sin 5x$$

$$4.) u = e^{2x} \quad v = \sin 3x$$
$$\frac{du}{dx} = 2e^{2x} \quad \frac{dv}{dx} = 3\cos 3x$$
$$\frac{dy}{dx} = (\sin 3x)(2e^{2x}) + (e^{2x})(3\cos 3x)$$

$$5.) u = \tan 7x \quad v = \sin x$$
$$\frac{du}{dx} = 7\sec^2 7x \quad \frac{dv}{dx} = \cos x$$
$$\frac{dy}{dx} = \frac{(\sin x)(7\sec^2 7x) - (\tan 7x)(\cos x)}{(\sin x)^2}$$

$$6.) y = (6x^2 - 3x + 5)^{1/2}$$
$$= \frac{1}{2} (6x^2 - 3x + 5)^{-1/2} (12x - 3)$$
$$\frac{dy}{dx} = (6x - 1.5)(6x^2 - 3x + 5)^{-1/2}$$

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QUESTION 2

1.) $\sin x = 0.43$

$$x = \sin^{-1}(0.43)$$

$$x = 25.47^\circ$$

$$x = 180^\circ - 25.47^\circ$$

$$\boxed{x = 154.53^\circ}$$

2.) $5 \tan x = -7$

$$\tan x = \frac{-7}{5}$$

$$x = \tan^{-1}(-7/5)$$

$$x = -54.46^\circ$$

$$x = 360 - 54.46$$

$$\boxed{x = 305.54^\circ}$$

$$x = 180 - 54.46$$

$$\boxed{x = 125.54^\circ}$$

3.) $5 \cos x = 3$

$$\cos x = \frac{3}{5}$$

$$x = \cos^{-1}(3/5)$$

$$x = 53.13$$

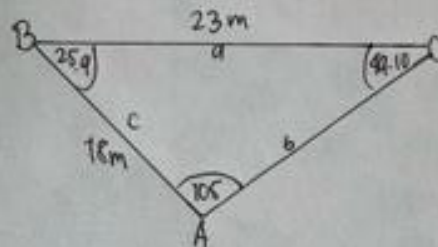
$$x = 360 - 53.13$$

$$\boxed{x = 306.87}$$

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QUESTION THREE



$$\boxed{\text{ANGLE C: } 49.10^\circ}$$

$$\text{ANGLE B} = 180 - 105 - 49.10$$

$$\boxed{B = 25.9^\circ}$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{23}{\sin 105} = \frac{b}{\sin B} = \frac{18}{\sin C} \rightarrow \frac{23}{\sin 105} = \frac{18}{\sin C} = \frac{18 \sin 105}{23}$$

$$\sin C = \frac{18 \sin 105}{23} = \frac{18(0.9659)}{23} = \frac{17.3862}{23} = 0.7559$$

$$\sin C = 0.7559$$

$$C = \sin^{-1}(0.7559)$$

$$\boxed{C = 49.10}$$

$$\overline{AC} : \frac{23}{\sin 105} = \frac{AC}{\sin 25.9} = \frac{18}{\sin 49.10} \rightarrow \frac{AC}{\sin 25.9} = \frac{23}{\sin 105} = \frac{23 \sin 25.9}{\sin 105}$$

$$AC = \frac{23(0.4368)}{0.9659} = 10.40 \text{ m}$$

$$\boxed{AC = 10.40 \text{ m}}$$

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QUESTION FOUR

$$y = \frac{t(x^2 + R)}{\theta}$$

$$y\theta = t(x^2 + R)$$

$$\frac{y\theta}{t} = x^2 + R$$

FINAL ANSWER:

$$x = \sqrt{\frac{y\theta}{t} - R}$$

$$\frac{y\theta}{t} - R = x^2$$

$$\sqrt{\frac{y\theta}{t} - R} = x$$

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QUESTION FIVE:

1.) $3^{x+4} = 7^x$

$$(x+4) \log 3 = x \log 7$$

$$(x+4) 0.48 = 0.85x$$

$$0.48x + 1.92 = 0.85x$$

$$1.92 = 0.85x - 0.48x$$

$$1.92 = 0.37x$$

$$\frac{1.92}{0.37} = x$$

$$x = 5.19$$

2.) $\log(x+5)(x+2) = \log(x+7)(x+6)$

$$x^2 + 2x + 5x + 10 = x^2 + 6x + 7x + 42$$

$$7x + 10 = 13x + 42$$

$$10 - 42 = 13x - 7x$$

$$-32 = 6x$$

$$\frac{-32}{6} = x$$

$$x = -5.33$$

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QUESTION SIX

$$\begin{aligned} 1.) \quad & \frac{x^9}{9} + \frac{4x^4}{4} + \frac{5x^2}{2} + x + C \\ & = \boxed{\frac{x^9}{9} + x^4 + \frac{5x^2}{2} + x + C} \end{aligned}$$

2.) (NEXT PAGE)

$$\begin{aligned} 3.) \quad & 5 \int \frac{1}{3} \cos 3x \, dx \\ & = 5 \left(\frac{1}{3} \cos 3x \, dx \right) + C \\ & = \boxed{\frac{5}{3} \cos 3x \, dx + C} \end{aligned}$$

$$\begin{aligned} 4.) \quad & \int_0^5 \frac{x^2 + x + 5x + 5}{x^2 + 6x} \, dx \\ & \left[\frac{x^3}{3} + \frac{6x^2}{2} \right]_0^5 \quad \left[\frac{(5)^3}{3} + \frac{6(5)^2}{2} \right] \\ & \left[\frac{125}{3} + \frac{750}{2} \right] \\ & [41.67 + 375] = \boxed{416.67} \end{aligned}$$

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QUESTION SIX

$$2.) \int 5x^2(x^3+2x+1) dx = \int (5x^5 + 10x^3 + 5x^2) dx$$

$$= \int 5x^5 dx + \int 10x^3 dx + \int 5x^2 dx$$

$$= 5 \int x^5 dx + 10 \int x^3 dx + 5 \int x^2 dx$$

$$= 5 \frac{x^{5+1}}{5+1} + 10 \frac{x^{3+1}}{3+1} + 5 \frac{x^{2+1}}{2+1} + C$$

$$= \boxed{5 \frac{x^6}{6} + \frac{5x^4}{2} + \frac{5x^3}{3} + C}$$