5.7: Intgration with inverse trig

Completing the square

$$x^2 - 12x + 7$$

$$\underbrace{x^2 - 12x + 36}_{(x-6)^2} + 7 - 36$$

$$-29$$

$\left(\frac{12}{2}\right)^2$

1.) $\int \frac{dx}{x^2-2x+11} = \int \frac{dx}{(x-1)^2+10}$

$x^2-2x+1 + 11-1$

$(x-1)^2+10$

$u = x-1 \quad a = \sqrt{10}$

$du = 1dx$

$\frac{1}{\sqrt{10}} \arctan \frac{x-1}{\sqrt{10}} + C$

2.) $\int \frac{dx}{x^2+6x+20} = \int \frac{dx}{(x+3)^2+11}$

$x^2+6x+9 \quad +20-9$

$(x+3)^2+11$

$u = x+3 \qquad a = \sqrt{11}$

$du = 1\,dx$

$\frac{1}{\sqrt{11}} \arctan \frac{x+3}{\sqrt{11}} + C$

3.) $\int \frac{dx}{\sqrt{8x-x^2}} = \int \frac{dx}{\sqrt{16-(x-4)^2}}$

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$-(x^2-8x+16)+16$

$-(x-4)^2+16$

$a=4$

$u=x-4$

$du=1dx$

$\arcsin\frac{x-4}{4}+C$