⑤ $f(x) = \sqrt{x-4}$ $g(x) = x^2-3$

$f(g(x)) = \sqrt{g(x)-4}$

$f(x^2-3) = \sqrt{x^2-3-4} = \sqrt{x^2-7}$

$x^2-7 \geq 0$

D: $\{x \mid x \leq \sqrt{7}, x \geq \sqrt{7}, x \in R\}$

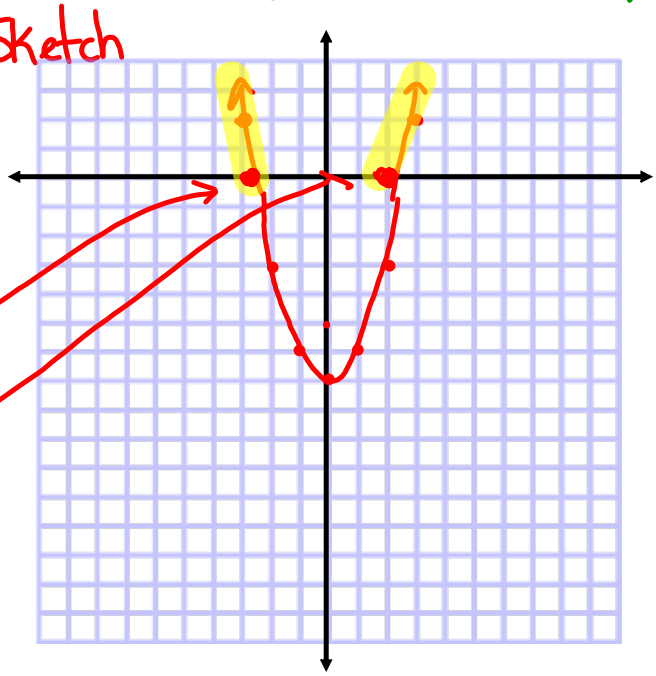
- $y = x^2-7$ → Sketch

Roots:

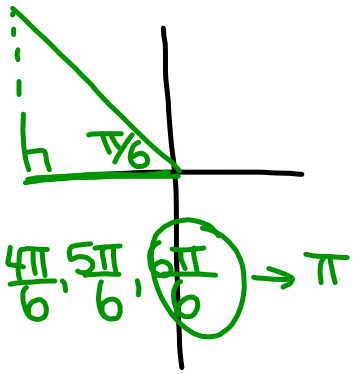
$0 = x^2-7$

$7 = x^2$

$\pm\sqrt{7} = x$



(11) $\left[\cos\left(\frac{5\pi}{6}\right)\right]^2 - \left[\sin\left(\frac{5\pi}{6}\right)\right]^2$




$\left[\left(-\frac{\sqrt{3}}{2}\right)\right]^2 - \left[\left(+\frac{1}{2}\right)\right]^2$

$\frac{3}{4} - \frac{1}{4}$

$\frac{1}{2}$

(13) $\tan\theta = -\sqrt{3} \quad -180° \le \theta \le 180°$

$\bar{\theta} = 60°$ Where is $\tan\theta$ negative

| Q2 | Q4 |
|---|---|
| $\theta = 180° - 60°$ | $\theta = 360° - 60°$ |
| $\theta = 120°$ | $\theta = 300°$ |
| | $\theta = -60°$ |

(25) Given:

Initial Amount = 35000

Base = 0.8

a) $V = (35000)(0.8)^{\frac{t}{1}}$

b) $V = (35000)(0.8)^{2}$

$V = \$22400$

c) $\frac{3000}{35000} = \frac{35000(0.8)^{t}}{35000}$

$0.0857 = (0.8)^{t}$

$\log 0.0857 = t \log 0.8$

$\frac{\log 0.0857}{\log 0.8} = \frac{t \log 0.8}{\log 0.8}$

11 years = t

26 Given.

Base $= \frac{1}{2}$

$A_0 = 60\text{mg}$

a) $A = 60\left(\frac{1}{2}\right)^{\frac{t}{5.3}}$

b) $t = 10.6$

$A = 60\left(\frac{1}{2}\right)^{\frac{10.6}{5.3}}$

$A = 60\left(\frac{1}{2}\right)^{2}$

$A = 60\left(\frac{1}{4}\right)$

$A = 15\text{mg}$

c) $12.5\% \times 60$

$0.125 \times 60$

$7.5\text{mg}$

$\frac{7.5}{60} = \frac{60\left(\frac{1}{2}\right)^{\frac{t}{5.3}}}{60}$

$0.125 = (0.5)^{\frac{t}{5.3}}$

$\log 0.125 = \log (0.5)^{\frac{t}{5.3}}$

$\frac{\log 0.125}{\log 0.5} = \frac{\frac{t}{5.3}(\log 0.5)}{\log 0.5}$

$5.3 \quad 3 = \frac{t}{5.3} \cdot 5.3$

$15.9 \text{ years} = t$

③ $\log_6(x-1) + \log_6(x+4) = 2$

$\log_6[(x-1)(x+4)] = 2$

$\log_6(x^2+3x-4) = 2$

Convert to exp

$6^2 = x^2+3x-4$

$36 = x^2+3x-4$

$0 = x^2+3x-40$

$0 = (x+8)(x-5)$

$x+8=0$ | $x-5=0$

$x=-8$ | $x=5$

Test $x=-8$

$\log_6(-8-1)+\log_6(-8+4) = 2$

$\log_6(-9)+\log_6(-4)$

extraneous

Test $x=5$

$\log_6(5-1)+\log_6(5+4) = 2$

$\log_6 4 + \log_6 9$

$\log_6 36$

$2$

$$\frac{\tan\theta - 1}{\tan\theta}$$

$$\frac{\tan\theta}{\tan\theta} - \frac{1}{\tan\theta}$$

$$1 - \cot\theta$$

$\tan^4\theta = \sec^4\theta(1 - 2\cos^2\theta + \cos^4\theta)$

$\frac{\sin^4\theta}{\cos^4\theta}$ | $\frac{1}{\cos^4\theta}(1-\cos^2\theta)(1-\cos^2\theta)$

$\frac{1}{\cos^4\theta}(\sin^2\theta)(\sin^2\theta)$

$\frac{\sin^4\theta}{\cos^4\theta}$

$$y = 2\log_5(3(x+5)) + 6$$

x int $(y=0)$

$$0 = 2\log_5(3x+15) + 6$$
$$-6 = 2\log_5(3x+15)$$
$$-3 = \log_5(3x+15)$$
$$5^{-3} = 3x+15$$
$$\frac{1}{125} = 3x+15$$
$$\frac{1}{125} - \frac{1875}{125} = 3x$$
$$\frac{-1874}{125} \cdot \frac{1}{3} = x$$
$$\frac{-1874}{375} = x$$
$$-4.997 = x$$

y int $(x=0)$

$$y = 2\log_5(3(0)+15) + 6$$
$$y = 2\log_5(15) + 6$$
$$y = 2(1.68) + 6$$
$$y = 3.36 + 6$$
$$y = 9.36$$

$f(x) = \sqrt{3x+6}$

① $y = \sqrt{3x+6}$

② $x = \sqrt{3y+6}$

③ $x^2 = 3y+6$

$x^2 - 6 = 3y$

$\frac{x^2-6}{3} = y$

$y = \frac{x^2-6}{3}$ or $y = \frac{1}{3}x^2 - 2$

④ $f^{-1}(x) = \frac{x^2-6}{3}$