

HM3 Extra Final Review

① $P = \$7018$ $r = .03$
 $n = 12$ $t = 18$

$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$

$$A = 7018 \left(1 + \frac{.03}{12}\right)^{12(18)}$$

$$A = \$12,034.82$$

② $P = \$7254$ $r = .04$
 $A = 11723$

$$A = Pe^{rt}$$

$$11723 = 7254 e^{.04t}$$

$$1.61607 = e^{.04t}$$

$$\ln 1.61607 = .04t$$

$$.4799997 = .04t$$

$$\sim 12 \text{ years}$$

③ $P = \$4155$ $n = 6$ $t = 12$

$$A = 5950.14$$

$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$

$$5950.14 = 4155 \left(1 + \frac{r}{6}\right)^{6(12)}$$

$$1.432043321 = \left(1 + \frac{r}{6}\right)^{12}$$

$$1.004999991 = 1 + \frac{r}{6}$$

$$.004999991 = \frac{r}{6}$$

$$.029999944 = r$$

$$\sim 3\%$$

④ $r = .05$ $t = 6$

$$A = 5210.45$$

$$A = Pe^{rt}$$

$$5210.45 = Pe^{.05(6)}$$

$$5210.45 = Pe^{.3}$$

$$5210.45 = P(1.349858808)$$

$$\$3860 = P$$

⑤ $\left(\frac{1}{64}\right)^{-3p-3} = \frac{1}{8}$

$$(8^{-2})^{-3p-3} = 8^{-1}$$

$$6p + 6 = -1$$

$$6p = -7$$

$$p = -\frac{7}{6}$$

⑥ $e^{2v} - 6 = 31.2$

$$e^{2v} = 37.2$$

$$\ln 37.2 = 2v$$

$$1.8082 = v$$

$$\textcircled{7} \log_{14} (n^2 + 52) = \log_{14} (-15n - 2) \quad \textcircled{8} \log_7 3 - \log_7 (x+4) = 2$$

$$n^2 + 52 = -15n - 2$$

$$n^2 + 15n + 54 = 0$$

$$(n+9)(n+6) = 0$$

$$n = -9 \quad n = -6$$

$$\log_7 \frac{3}{x+4} = 2$$

$$7^2 = \frac{3}{x+4}$$

$$49(x+4) = 3$$

$$x+4 = \frac{3}{49}$$

$$x = -3.9388$$

$$\textcircled{9} 10^{2a+5} + 6 = 81.8$$

$$10^{2a+5} = 75.8$$

$$\log_{10} 75.8 = 2a+5$$

$$1.8797 = 2a+5$$

$$a = -1.5602$$

$$\textcircled{10} \ln x + \ln(x+4) = \ln 60$$

$$\ln(x^2 + 4x) = \ln 60$$

$$x^2 + 4x = 60$$

$$x^2 + 4x - 60 = 0$$

$$(x+10)(x-6) = 0$$

$$x = -10$$

$$x = 6$$

$$\textcircled{11} \frac{x+1}{2x^2} = \frac{1}{x^2} + \frac{1}{x} \quad \text{CD} = 2x^2$$

$$\frac{x+1}{2x^2} = \frac{2}{2x^2} + \frac{2x}{2x^2}$$

$$x+1 = 2+2x$$

$$-1 = x$$

$$\textcircled{12} \frac{12x-16}{x^2+2x-24} + \frac{1}{x-4} = \frac{1}{x+6}$$

$$\text{CD} = (x-4)(x+6)$$

$$\frac{12x-16}{(x-4)(x+6)} + \frac{x+6}{(x-4)(x+6)} = \frac{x-4}{(x-4)(x+6)}$$

$$12x-16+x+6 = x-4$$

$$13x-10 = x-4$$

$$12x = -6$$

$$x = -\frac{1}{2}$$

$$\frac{1}{k^2-9k+18} - 1 = \frac{k-1}{k^2-9k+18}$$

~~$$\frac{1}{k^2-9k+18} - \frac{(k^2-9k+18)}{k^2-9k+18} = \frac{k-1}{k^2-9k+18}$$~~

$$1 - k^2 + 9k - 18 = k - 1$$

$$-k^2 + 9k - 17 = k - 1$$

$$0 = k^2 - 8k + 16$$

$$0 = (k-4)(k-4)$$

$$k=4$$

$$(14) -2 = 2 + \tan \theta$$

$$-1 = \tan \theta$$

$$\theta = 3\pi/4, 7\pi/4$$

$$(15) 5 - \sin \theta = 6$$

$$-\sin \theta = 1$$

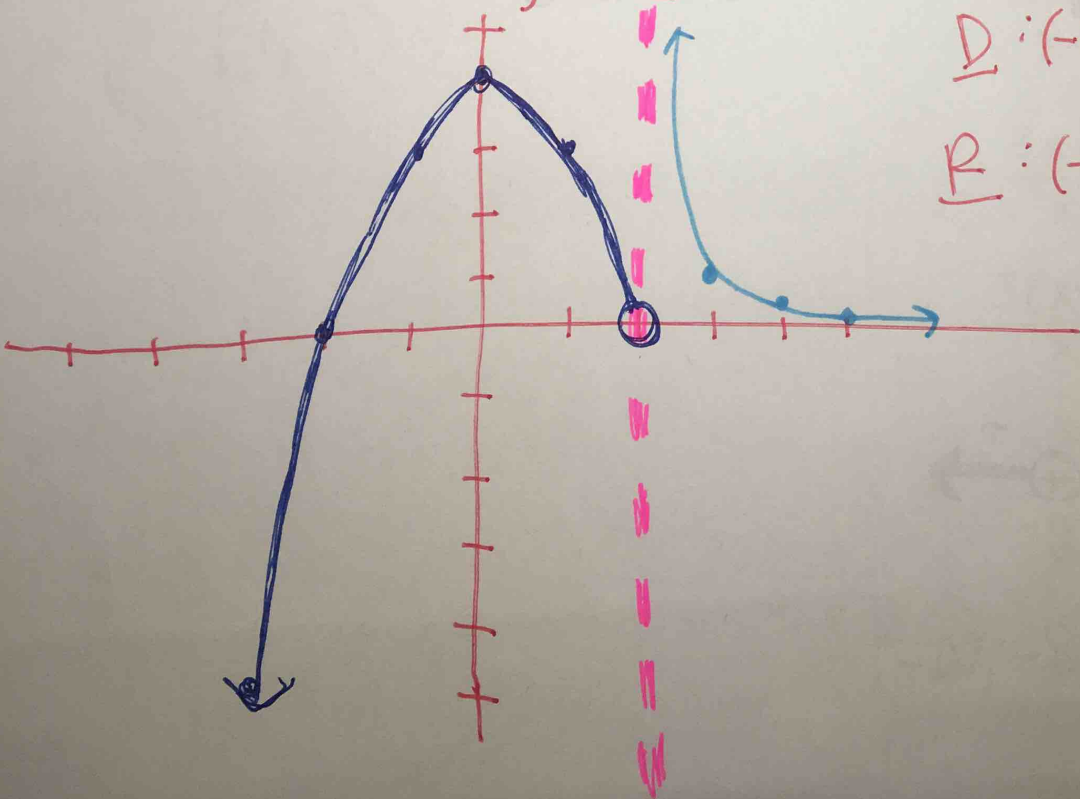
$$\sin \theta = -1$$

$$\theta = 3\pi/2$$

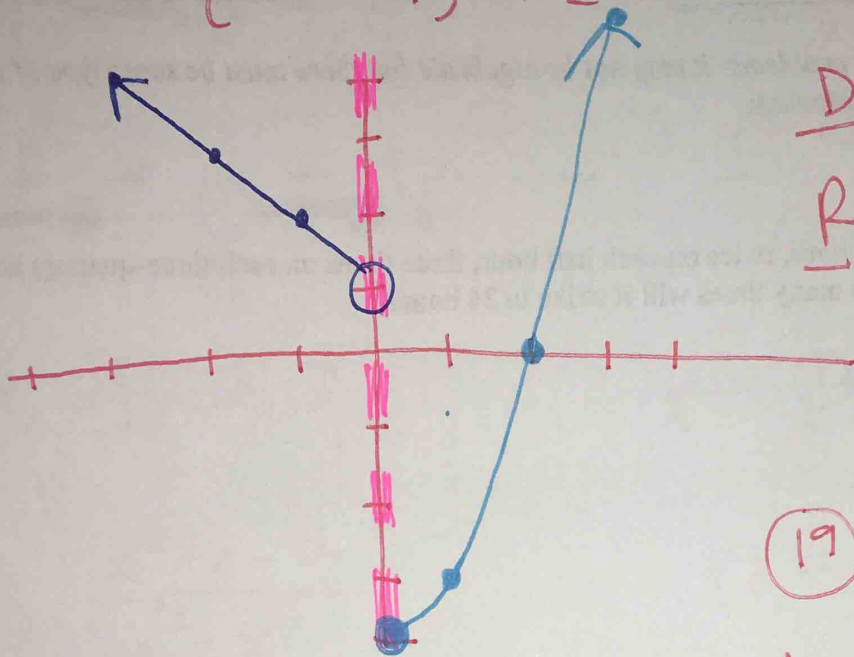
$$(16) g(x) = \begin{cases} 4-x^2, & x < 2 \\ \frac{1}{x-2}, & x \geq 2 \end{cases}$$

$$D: (-\infty, 2) \cup (2, \infty)$$

$$R: (-\infty, \infty)$$



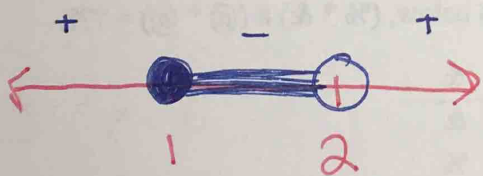
$$① f(x) = \begin{cases} |x-1|, & x < 0 \\ x^2 - 4, & x \geq 0 \end{cases}$$



$$D: (-\infty, \infty)$$

$$R: [-4, \infty)$$

$$⑧ \frac{x-1}{x-2} \leq 0 \quad \text{critical values: } 1, 2$$



$$[1, 2)$$

$$⑨ \frac{x+38}{x-7} > -2$$

★ must set it to zero ★

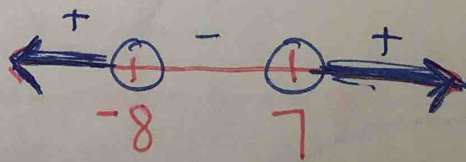
$$\frac{x+38}{x-7} + 2 > 0$$

$$\frac{x+38}{x-7} + \frac{2(x-7)}{x-7} > 0$$

$$\frac{x+38+2x-14}{x-7} > 0$$

$$\frac{3x+24}{x-7} > 0$$

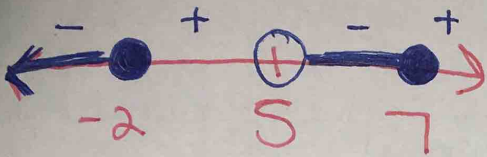
$$\frac{3(x+8)}{x-7} > 0 \quad \text{CV's: } -8, 7$$



$$(-\infty, -8) \cup (7, \infty)$$

$$\frac{(x+2)(x-7)}{x-5} \leq 0$$

CVs: -2, 7, 5

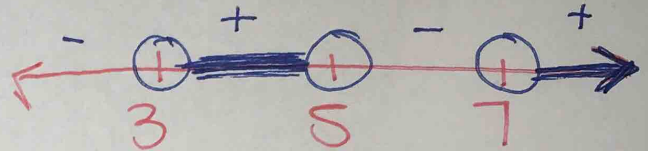


$$(-\infty, -2] \cup (5, 7]$$

$$\textcircled{21} \frac{x-3}{x^2-12x+35} > 0$$

$$\frac{x-3}{(x-7)(x-5)} > 0$$

CVs: 3, 7, 5



$$(3, 5) \cup (7, \infty)$$

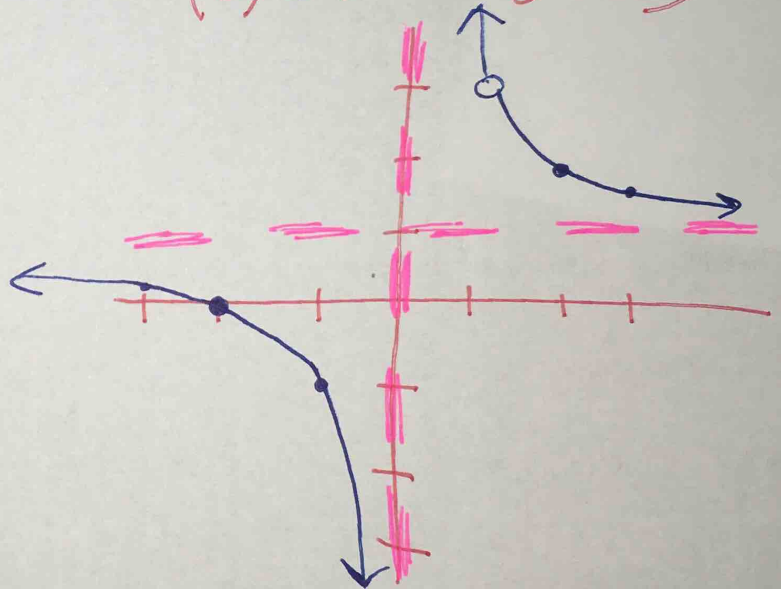
$$\textcircled{22} f(x) = \frac{x^2+x-2}{x^2-x}$$

$$f(x) = \frac{(x+2)(x-1)}{x(x-1)}$$

VA: $x=0$

hole: $x=1$

HA: $y=1$



$$\textcircled{23} f(x) = -\frac{2}{x^2+x-2}$$

$$f(x) = -\frac{2}{(x+2)(x-1)}$$

VA: $x=-2, x=1$

hole: none

HA: $y=0$

