

MATH 1050 - Review for Chapter 1 Exam

1.1 (16) $5(x+3) + 4x - 3 = -(2x-4) + 2$

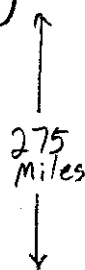
$$5x + 15 + 4x - 3 = -2x + 4 + 2$$

$$9x + 12 = -2x + 6$$

$$11x = -6$$

$$x = \frac{-6}{11}$$

1.2 (22)



$$R_N = R_S + 50$$

$$T_N = T_S = \frac{1}{2} \text{ Hr}$$

$$D_N + D_S = 275$$

$$R_N T_N + R_S T_S = 275$$

$$(R_S + 50) \frac{1}{2} + R_S \left(\frac{1}{2}\right) = 275$$

$$\frac{1}{2} R_S + 25 + \frac{1}{2} R_S = 275$$

$$R_S = 250 \text{ MPH}$$

$$R_N = 300 \text{ MPH}$$

1.2 (32)

mL Solution	%	mL Acid
x	.05	$.05x$
60	.20	12
$x + 60$.10	$.1x + 6$

$$.05x + 12 = .1x + 6$$

$$5x + 1200 = 10x + 600$$

$$600 = 5x$$

$$120 = x$$

120 mL of 5% acid

1.3 (39) $\frac{10 + \sqrt{-200}}{5} = \frac{10 + 10\sqrt{2}i}{5} = 2 + 2\sqrt{2}i$

85 $\frac{2-i}{2+i} (2-i) = \frac{4-4i+i^2}{4-i^2} = \frac{4-4i-1}{4-(-1)}$
 $= \frac{3-4i}{5} = \frac{3}{5} - \frac{4}{5}i$

1.4 (27) $(x+5)^2 = -3 \Rightarrow x+5 = \pm\sqrt{-3} \Rightarrow x = -5 \pm i\sqrt{3}$

61 $x^3 - 8 = 0 \Rightarrow (x-2)(x^2 + 2x + 4) = 0$
 $x = 2 \quad x = \frac{-2 \pm \sqrt{2^2 - 4(1)(4)}}{2(1)} = \frac{-2 \pm \sqrt{-12}}{2} = \frac{-2 \pm 2\sqrt{3}i}{2} = -1 \pm \sqrt{3}i$

1.5 (26) $V = lwh$

$$182.742 = l(l-3.1875)2.3125$$

$$182.742 = 2.3125l^2 - 7.37109375l$$

$$0 = 2.3125l^2 - 7.37109375l - 182.742$$

$$l = \frac{7.37109375 \pm \sqrt{7.37109375^2 - 4(2.3125)(-182.742)}}{2(2.3125)}$$

$$l = 10.625007201 \text{ or } -7.43750720097$$

43 $s = -2.7t^2 + 30t + 6.5$

a) $12 = -2.7t^2 + 30t + 6.5$

$$2.7t^2 - 30t + 5.5 = 0 \quad t = \frac{.19 \text{ or } 10.92 \text{ seconds}}$$

Solve with QUADRATIC FORMULA (As shown in #26)

b) $0 = -2.7t^2 + 30t + 6.5$

$$t = 11.32 \text{ seconds}$$

1.6 (27) $\frac{1}{T} = \frac{1}{T_1} + \frac{1}{T_2} \Rightarrow \frac{1}{T} = \frac{1}{3} + \frac{1}{5} \Rightarrow \frac{1}{T} = \frac{5}{15} + \frac{3}{15}$

$$T = \frac{15}{8} \text{ Hr}$$

$$15 = 5T + 3T \Rightarrow 15 = 8T \Rightarrow T = \frac{15}{8} \text{ Hr}$$

or 1.875 Hrs
or 11.25 Min
30s

1.6 (85) $x^{-2/3} + x^{-1/3} - 6 = 0$

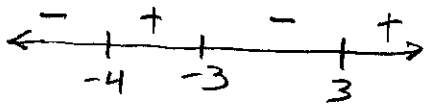
Let $u = x^{-1/3}$
Then $u^2 = x^{-2/3}$

$u^2 + u - 6 = 0$
 $(u+3)(u-2) = 0$
 $u = -3 \quad u = 2$

$x^{-1/3} = -3 \quad x^{-1/3} = 2$
 $x = (-3)^{-3} \quad x = 2^{-3}$
 $x = -\frac{1}{27} \quad x = \frac{1}{8}$

1.7 (65) $x^3 + 4x^2 - 9x \geq 36 \Rightarrow x^3 + 4x^2 - 9x - 36 \geq 0$

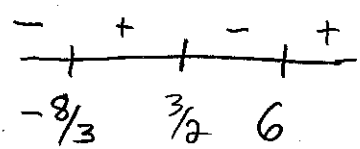
$x^2(x+4) - 9(x+4) \geq 0$
 $(x^2-9)(x+4) \geq 0$
 $(x+3)(x-3)(x+4) \geq 0$



$[-4, -3] \cup [3, \infty)$

$x \neq 6$

(91) $\frac{(2x-3)(3x+8)}{(x-6)^3} \geq 0$



$[-\frac{8}{3}, \frac{3}{2}] \cup (6, \infty)$

1.R (35) $i^{-27} = i^{-28} \cdot i^1 = (1)(i) = i$

(39) $2x^2 + x - 15 = 0$
 $2x^2 + 6x - 5x - 15 = 0$
 $2x(x+3) - 5(x+3) = 0$
 $(2x-5)(x+3) = 0$
 $x = \frac{5}{2}, -3$

(51) $-6x^2 + 2x = -3$
 $-6x^2 + 2x + 3 = 0$
 $6x^2 - 2x - 3 = 0$
DISCR = $b^2 - 4ac$
DISCR = $(-2)^2 - 4(6)(-3)$
 $= 4 + 72 = 76$

Therefore 2 Distinct Irrational Solutions

(78) $\sqrt{5x-15} - \sqrt{x+1} = 2$
 $\sqrt{5x-15} = 2 + \sqrt{x+1}$ Square Both Sides

$5x-15 = 4 + 4\sqrt{x+1} + x+1$
 $4x-20 = 4\sqrt{x+1}$
 $x-5 = \sqrt{x+1}$ Square Both Sides
 $x^2-10x+25 = x+1 \Rightarrow (x-8)(x-3) = 0$
 $x^2-11x+24=0$
 $x=8$ (check)
 $x=3$ (fails the check)

(103) $s = 320t - 16t^2$

a) Hitting Ground $\Rightarrow s=0$
 $0 = 320t - 16t^2$
 $0 = 16t(20-t)$
 $t=0 \quad t=20$
Projectile hits ground after 20s

b) $576 < 320t - 16t^2$
 $16t^2 - 320t + 576 < 0$
 $t^2 - 20t + 36 < 0$
 $(t-2)(t-18) < 0$
 $2 \quad 18$
 $(2 \text{ to } 18 \text{ sec}) \quad (2, 18)$

(117) $|2x+9| \leq 3$

$2x+9 \leq 3$ AND $2x+9 \geq -3$
 $-3 \leq 2x+9 \leq 3$
 $-12 \leq 2x \leq -6$
 $-6 \leq x \leq -3$

$[-6, -3]$

(122) $|7x+8| - 6 > -3$

$|7x+8| > 3$

$7x+8 > 3$ OR $7x+8 < -3$
 $7x > -5$ OR $7x < -11$
 $x > -\frac{5}{7}$ OR $x < -\frac{11}{7}$

$(-\infty, -\frac{11}{7}) \cup (-\frac{5}{7}, \infty)$