Math 1010 Final Exam Review

Answer Key

① Solve $6x-(5x-1)=2$

$6x-5x+1=2$

$x+1=2$

$-1 \quad -1$

$x=1$

$\boxed{x=1}$

② Solve $-8b-10=-7-6b$

$+6b \qquad +6b$

$-2b-10=-7$

$+10 \quad +10$

$\frac{-2b}{-2}=\frac{3}{-2}$

$b=-\frac{3}{2}$

$\boxed{b=-\frac{3}{2} \text{ or } -1\frac{1}{2}}$

③ Find Slope between $(-9,-8)$ & $(4,9)$

$m=\frac{y_2-y_1}{x_2-x_1}=\frac{9-(-8)}{4-(-9)}=\frac{9+8}{4+9}=\frac{17}{13}$

$\boxed{m=\frac{17}{13}}$

④ Write $3x-6y=2$ in Slope-intercept Form

$-3x \quad -3x$

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

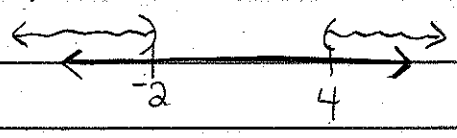
$y=\frac{1}{2}x-\frac{1}{3}$

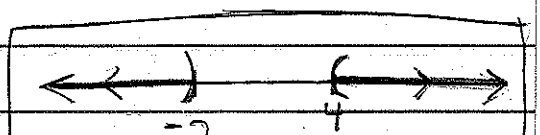
$\boxed{y=\frac{1}{2}x-\frac{1}{3}}$

(8) Solve. Give Solution in graph & interval notation.

$x-2>2$ (+2 +2) or $x+3<1$ (−3 −3)

$x>4$ or $x<-2$





$(-\infty, -2) \cup (4, \infty)$

(9) Solve $|6m+5| = 6$

$6m+5=6$ (−5 −5) $\quad 6m+5=-6$ (−5 −5)

$\frac{6m}{6} = \frac{1}{6} \quad \frac{6m}{6} = \frac{-11}{6}$

$m = \frac{1}{6} \quad m = \frac{-11}{6}$

$\left\{\frac{-11}{6}, \frac{1}{6}\right\}$

(10) Solve $5|9x+1|+3<23$ (−3 −3)

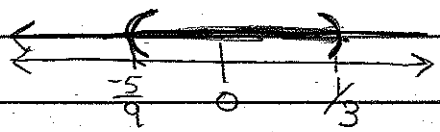
$\frac{5|9x+1|}{5} < \frac{20}{5}$

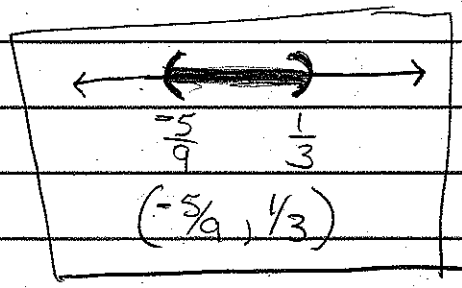
$|9x+1| < 4$

$9x+1<4$ (−1 −1) and $9x+1>-4$ (−1 −1)

$\frac{9x}{9} < \frac{3}{9}$ and $\frac{9x}{9} > \frac{-5}{9}$

$x < \frac{1}{3}$ and $x > -\frac{5}{9}$





$(-5/9, 1/3)$

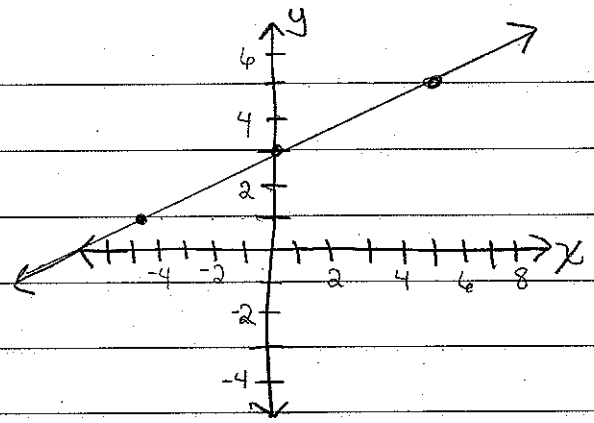
(5) Graph $2x - 5y = -15$

$-2x \qquad -2x$

$-5y = -2x - 15$

$\frac{-5y}{-5} = \frac{-2x}{-5} - \frac{15}{-5}$

$y = \frac{2}{5}x + 3$



(6) Find the midpoint between $(5,3)$ & $(2,7)$

$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right) = \left(\frac{5+2}{2}, \frac{3+7}{2}\right)$

$= \left(\frac{7}{2}, \frac{10}{2}\right) = \boxed{\left(\frac{7}{2}, 5\right)}$

(7) Are the lines parallel, perpendicular or neither? (compare slopes)

$3x - 2y = -9$ $\qquad$ $2x + 3y = -3$

$-3x \quad -3x$ $\qquad$ $-2x \quad -2x$

$\frac{-2y}{-2} = \frac{-3x}{-2} - \frac{9}{-2}$ $\qquad$ $\frac{3y}{3} = \frac{-2x}{3} - \frac{3}{3}$

$y = \frac{3}{2}x + \frac{9}{2}$ $\qquad$ $y = -\frac{2}{3}x - 1$

$m = \frac{3}{2}$ $\qquad$ $m = -\frac{2}{3}$

Since the slopes are opposite signs & reciprocals, the lines are Perpendicular

(16) Factor completely $125x^3 + 27$ Sum of Cubes

$5^3 = 125 \quad 3^3 = 27$

$$(5x+3)(25x^2-15x+9)$$

(17) Factor completely

$24m^7 - 20m^5 - 28m^3$ GCF

$4m^3(6m^4 - 5m^2 - 7)$

$$4m^3(6m^4 - 5m^2 - 7)$$

(18) Factor Completely

$x^2 + 16x + 64$ No GCF Factors of 64 Add to 16 $\}$ 8 + 8

$(x+8)(x+8)$

$(x+8)^2$

$$(x+8)^2$$

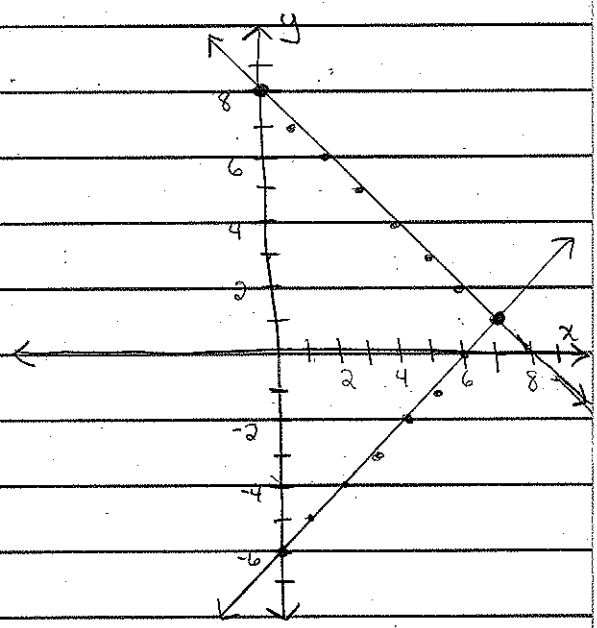
(19) Solve the System by Graphing

$x - y = 6$ $\qquad$ $x + y = 8$

$-y = -x + 6$ $\qquad$ $y = -x + 8$

$y = x - 6$

Solution $(7, 1)$



(11) Simplify $(-4p)^2 (-4p)^6$

$4^2p^2 \cdot 4^6p^6$

4^8p^8

$\boxed{4^8p^8}$

(12) Simplify $\left(\frac{3p^3v^4}{s^4}\right)^2$

$\frac{3^2p^6v^8}{s^8}$

$\boxed{\frac{3^2p^6v^8}{s^8}}$

(13) $(3p-1)(9p^2+3p+1)$

$27p^3+9p^2+3p$

$-9p^2-3p-1$

$27p^3 \quad -1$

$\boxed{27p^3-1}$

(14) $(-6x^3+9x^2+4)-(-5x^3+2x-5)$

$-6x^3+9x^2+4+5x^3-2x+5$

$-1x^3+9x^2-2x+9$

$\boxed{-x^3+9x^2-2x+9}$

(15)

$$x+9 \overline{)\, x^2+2x-63}$$

$x-7$

$\ominus x^2 \oplus 9x$

$-7x-63$

$\oplus 7x \oplus 63$

0

$\boxed{x-7}$

(20) **Solve by substitution**

$x - 6y = 24$

$x = 6y + 24$

$x = 6(-3) + 24$

$x = -18 + 24$

$x = 6$

$-7x - 7y = -21$

$-7(6y + 24) - 7y = -21$

$-42y - 168 - 7y = -21$

$-49y - 168 = -21$

$+168 \quad +168$

$\frac{-49y}{-49} = \frac{147}{-49}$

$y = -3$

Solve by Elimination

$x - 6y = 24 \quad \times 7 = 7x - 42y = 168$

$-7x - 7y = -21 \quad -7x - 7y = -21$

$-49y = 147$

$\frac{-49y}{-49} = \frac{147}{-49}$

$y = -3$

$x - 6y = 24$

$x - 6(-3) = 24$

$x + 18 = 24$

$-18 \quad -18$

$x = 6$

$(6, -3)$

(21) Jill + Joe = 20

$(2.5)(5) + (x)(5) = 20$

$12.5 + 5x = 20$

$-12.5 \quad -12.5$

$5x = 7.5$

$x = 1.5$

Joe walked @ 1.5 mph

(22) $5 bills + $20 bills = $775

$(5)(x) + (20)(x+5) = 775$

$5x + 20x + 100 = 775$

$25x + 100 = 775$

$25x = 675$

$x = 27$

27 $5 bills

(23) 12% + 8% = 8000

$(.12)(x) + (.08)(70{,}000 - x) = 8000$

$.12x + 5{,}600 - .08x = 8000$

$.04x + 5{,}600 = 8000$

$.04x = 2{,}400$

$x = 60{,}000$

She invested $60,000 @ 12%

(24) 40% + 90% = 60%

$(.4)(x) + (.9)(20) = .6(x+20)$

$.4x + 18 = .6x + 12$

$-.6x \quad -.6x$

$-.2x + 18 = 12$

$-18 \quad -18$

$-.2x = -6$

$x = 30$

30 liters of 40% solution

(25) $S = \frac{1}{2}at^2 + v_0t + S_0$ $\quad v_0 = 400$ ft/sec $\quad S_0 = 0$

$a = -32$ ft/sec^2 $\quad S = 2500$

$2500 = \frac{1}{2}(-32)t^2 + 400t + 0$

$2500 = -16t^2 + 400t$

$+16t^2 - 400t \quad +16t^2 - 400t$

$16t^2 - 400t + 2500 = 0$

$4(4t^2 - 100t + 625) = 0$

$t = \frac{-(-100) \pm \sqrt{100^2 - 4(4)(625)}}{2(4)} = \frac{100 \pm \sqrt{10{,}000 - 10{,}000}}{8}$

$= \frac{100}{8} = 12.5$

12.5 sec

(26) Simplify $\sqrt[3]{9x} \cdot \sqrt[3]{49x}$

$=$

$= \sqrt[3]{441x^2}$

$\sqrt[3]{441x^2}$

(27) Simplify $\sqrt[3]{1000x^4y^5}$

1000 → 100 · 10 → 10 · 10

$= \sqrt[3]{10^3 x^4 y^5}$

$10xy\sqrt[3]{xy^2}$

$= 10xy\sqrt[3]{xy^2}$

(28) Simplify $\sqrt{5x} + 7\sqrt{80x} + 2\sqrt{180x}$

$80 = 8 \cdot 10 = 2 \cdot 4 \cdot 2 \cdot 5$

$180 = 18 \cdot 10 = 9 \cdot 2 \cdot 2 \cdot 5 = 3 \cdot 3 \cdot 2 \cdot 2 \cdot 5$

$1\sqrt{5x} + 28\sqrt{5x} + 12\sqrt{5x}$

$41\sqrt{5x}$

$41\sqrt{5x}$

(29) $(\sqrt{3x}+3)(\sqrt{7x}-3)$

$\sqrt{21x^2} - 3\sqrt{3x} + 3\sqrt{7x} - 9$

$x\sqrt{21} - 3\sqrt{3x} + 3\sqrt{7x} - 9$

$\boxed{x\sqrt{21} - 3\sqrt{3x} + 3\sqrt{7x} - 9}$

(30) $\frac{3}{(9-\sqrt{2})} \cdot \frac{(9+\sqrt{2})}{(9+\sqrt{2})}$

$= \frac{3(9+\sqrt{2})}{81+9\sqrt{2}-9\sqrt{2}-\sqrt{4}}$

$= \frac{3(9+\sqrt{2})}{81-2} = \frac{3(9+\sqrt{2})}{79} = \boxed{\frac{27+3\sqrt{2}}{79}}$

(31) Write $5x - 6y = 5$ in function notation

y is the dependant variable

$\frac{5x - 6y = 5}{-5x \quad -5x}$

$\frac{-6y}{-6} = \frac{-5x}{-6} + \frac{5}{-6}$

$y = \frac{5}{6}x - \frac{5}{6}$

$\boxed{f(x) = \frac{5}{6}x - \frac{5}{6}}$

(32) $\{(-1,7)\ (1,-9)\ (4,-9)\ (7,-5)\ (10,-3)\}$

The relation is a function because none of the inputs (x) has more than 1 output (y).

$\boxed{\text{yes}}$

(33) The graph is NOT a function because it fails the vertical line test.

$\boxed{\text{NO}}$

(34) Solve $x^2+5x-24=0$ $\quad 24 = 3\cdot 8$

$(x-3)(x+8)=0$ $\quad -3+8=5$

$x-3=0 \quad x+8=0$

$x=3 \quad x=-8$

$\boxed{\{-8, 3\}}$

(35) Solve $\sqrt{8x+9} = 9$

$(\sqrt{8x+9})^2 = 9^2$

$8x+9=81$

$-9 \quad -9$

$8x = 72$

$x = 9$

$\boxed{x=9}$

Check $\sqrt{8(9)+9} = 9$?

$\sqrt{72+9} = 9$

$\sqrt{81} = 9$ ✓

(36) Solve $2n^2 = -10n - 7$

$2n^2+10n+7=0$ $\quad 14 = 2\cdot 7 = 9$ Does not Factor

$1\cdot 10 = 11$

Quadratic Formula

$$n = \frac{-10 \pm \sqrt{10^2-4(2)(7)}}{2(2)}$$

$$= \frac{-10 \pm \sqrt{100-56}}{4}$$

$$= \frac{-10 \pm \sqrt{44}}{4} = \frac{-10 \pm 2\sqrt{11}}{4} = \frac{2(-5 \pm \sqrt{11})}{4} = \boxed{\frac{-5 \pm \sqrt{11}}{2}}$$

(37) Solve $\frac{x}{16} - \frac{3}{8} = \frac{x-8}{8}$

$16 \cdot \frac{x}{16} - \frac{3}{8} \cdot 16 = \frac{(x-8)}{8} \cdot 16$

$x - 3 \cdot 2 = 2(x-8)$

$x - 6 = 2x - 16$

$-2x \quad -2x$

$-x - 6 = -16$

$+6 \quad +6$

$-x = -10$

$x = 10$

$\boxed{x = 10}$

(38) Solve $\frac{-5x}{2x+12} = \frac{2x}{4x+24} + \frac{6x-1}{x+6}$

common denominator $4(x+6)$

$2(x+6) \quad 4(x+6) \quad (x+6)$

$\frac{-5x \cdot 2}{2(x+6) \cdot 2} = \frac{2x}{4(x+6)} + \frac{(6x-1) \cdot 4}{(x+6) \cdot 4}$

$-10x = 2x + 24x - 4$

$-10x = 26x - 4$

$-26x \quad -26x$

$-36x = -4$

$\frac{-36x}{-36} = \frac{-4}{-36}$

$x = \frac{1}{9}$

$\boxed{x = \frac{1}{9}}$

(39) Solve $3^x = 81$

81
$9 \cdot 9$
$3 \cdot 3 \quad 3 \cdot 3$

$3^x = 3^4$

$x = 4$

$\boxed{x = 4}$

(40) Solve $4^{(1+2x)} = 64$

64
$4 \cdot 16$
$4 \cdot 4$

$4^{(1+2x)} = 4^3$

$1 + 2x = 3$
$-1 \quad -1$

$2x = 2$

$x = 1$

$\boxed{x = 1}$

(41) Solve $\log_3 x = 2$

$3^2 = x$

$9 = x$

$\boxed{x = 9}$

(42) Solve $\log_{125} x = \frac{1}{3}$

$125^{1/3} = x$

$\sqrt[3]{125} = x$

$5 \cdot 25$
$5 \cdot 5$

$\sqrt[3]{5 \cdot 5 \cdot 5} = x$

$5 = x$

$\boxed{x = 5}$

(43) Solve by completing the square

$x^2 + 8x = 7$

$8 \div 2 = 4$

$4^2 = 16$

$x^2 + 8x + \underline{16} = 7 + 16$

$(x+4)^2 = 23$

$\sqrt{(x+4)^2} = \pm\sqrt{23}$

$x + 4 = \pm\sqrt{23}$

$-4 \quad -4$

$x = -4 \pm \sqrt{23}$

$x = -4 + \sqrt{23}$

$x = -4 - \sqrt{23}$

(44) Solve by completing the square

$x^2 + x + 5 = 0$

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

$(\frac{1}{2})^2 = \frac{1}{4}$

$x^2 + x + \underline{\frac{1}{4}} = -5 + \frac{1}{4}$

$-\frac{20}{4} + \frac{1}{4} = \frac{-19}{4}$

$\left(x + \frac{1}{2}\right)^2 = \frac{-19}{4}$

$\sqrt{(x+\frac{1}{2})^2} = \pm\sqrt{\frac{-19}{4}}$

$x + \frac{1}{2} = \pm\frac{\sqrt{-19}}{\sqrt{4}}$

$x + \frac{1}{2} = \pm\frac{i\sqrt{19}}{2}$

$-\frac{1}{2} \quad -\frac{1}{2}$

$x = -\frac{1}{2} \pm \frac{i\sqrt{19}}{2}$

$x = -\frac{1}{2} + \frac{\sqrt{19}}{2}i$

$x = -\frac{1}{2} - \frac{\sqrt{19}}{2}i$

(45) Use discriminant to decide solutions

$$v^2 + 7v + 1 = 0$$

$$b^2 - 4ac = 7^2 - 4(1)(1)$$
$$= 49 - 4$$
$$= 45$$

Since 45 is positive but not a perfect square, the equation has **two irrational solutions.**

(46) Use the discriminant to decide solutions

$$w^2 - 2w + 8 = 0$$

$$b^2 - 4ac = (-2)^2 - 4(1)(8)$$
$$= 4 - 32$$
$$= -28$$

Since $b^2 - 4ac$ is negative the equation has **two complex solutions**

(47) What is the vertex of $y = x^2 + 4x + 13$

$$x \text{ coordinate} = \frac{-b}{2a} = \frac{-4}{2(1)} = \frac{-4}{2} = -2$$

$$y\text{-coordinate} = (-2)^2 + 4(-2) + 13$$
$$= 4 - 8 + 13$$
$$= 9$$

The vertex is at $(-2, 9)$

(48) Graph $f(x) = 2x^2 - 2x - 5$

Vertex: $x = \frac{-b}{2a} = \frac{-(-2)}{2(2)} = \frac{2}{4} = \frac{1}{2}$

$y = 2\left(\frac{1}{2}\right)^2 - 2\left(\frac{1}{2}\right) - 5$

$= 2 \cdot \frac{1}{4} - \frac{2}{2} - \frac{10}{2}$

$= \frac{1}{2} - \frac{2}{2} - \frac{10}{2} = \frac{-11}{2}$

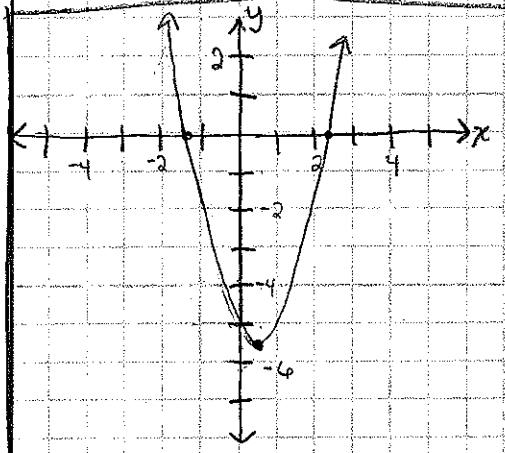
x-intercepts

$2x^2 - 2x - 5 = 0$

$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(2)(-5)}}{2(2)}$

$= \frac{2 \pm \sqrt{44}}{4}$

$\approx 2.2, -1.2$



vertex: $\left(\frac{1}{2}, \frac{-11}{2}\right)$

axis of symmetry: $x = \frac{1}{2}$

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

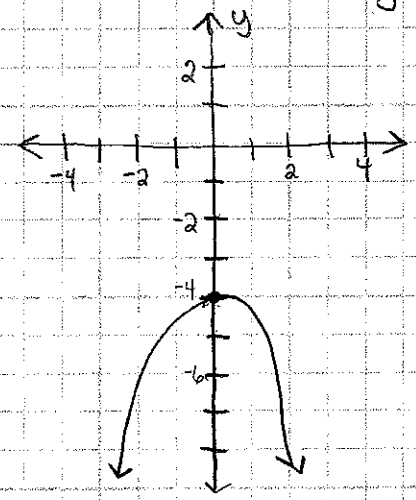
range: $\left[\frac{-11}{2}, \infty\right)$

(49) Graph $y = -x^2 - 4$

vertex: $x = \frac{-b}{2a} = \frac{-0}{2(-1)} = 0$

$y = -0^2 - 4 = -4$

opens down with vertex below x-axis
there are no x-intercepts



vertex: $(0, -4)$

axis of symmetry: $x = 0$

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

range: $(-\infty, -4]$

(50) Find $f(4)$ when $f(x) = x^2 - 4x + 2$

$$f(4) = (4)^2 - 4(4) + 2$$
$$= 16 - 16 + 2$$
$$= 2$$

$\boxed{f(4) = 2}$

(51) Find $f(-4)$ when $f(x) = 5x^2 + 2x + 5$

$$f(-4) = 5(-4)^2 + 2(-4) + 5$$
$$= 5(16) - 8 + 5$$
$$= 80 - 8 + 5$$
$$= 72 + 5$$
$$= 77$$

$\boxed{f(-4) = 77}$

(52) Find $(f-g)(x)$ for $f(x) = 4x - 3$ & $g(x) = -9x + 9$

$$(4x-3) - (-9x+9) = 4x - 3 + 9x - 9 = \boxed{13x - 12}$$

(53) Find $(fg)(x)$ for $f(x) = 4x + 2$ & $g(x) = -2x - 8$

$$(4x+2)(-2x-8) = -8x^2 - 32x - 4x - 16$$
$$= -8x^2 - 36x - 16$$

$\boxed{-8x^2 - 36x - 16}$

(54) Find $\left(\frac{f}{g}\right)(x)$ for $f(x) = x^2 + 9x + 20$ & $g(x) = x + 5$

$$\frac{x^2 + 9x + 20}{x+5} = \frac{(x+4)(x+5)}{x+5} = x + 4$$

$\boxed{x + 4}$

(55) Find $(f \circ g)(x)$ for $f(x) = x + 7$ & $g(x) = 8x - 2$

$(f \circ g)(x) = (8x-2) + 7 = 8x + 5$ $\boxed{8x+5}$

(56) $(3 - 4i) + (6 + 7i)$

$= 9 + 3i$ $\boxed{9+3i}$

(57) $(8 - 3i)(3 + 2i)$

$24 + 16i - 9i - 6i^2$

$24 + 7i - 6(-1)$

$24 + 6 + 7i$ $\boxed{30+7i}$

$30 + 7i$

(58) $\dfrac{(6+2i)}{(9-3i)}\dfrac{(9+3i)}{(9+3i)}$

$\dfrac{54 + 18i + 18i + 6i^2}{81 + 27i - 27i - 9i^2}$

$= \dfrac{54 + 36i + 6(-1)}{81 - 9(-1)}$

$= \dfrac{48 + 36i}{90} = \dfrac{48}{90} + \dfrac{36}{90}i = \dfrac{8}{15} + \dfrac{4}{10}i = \boxed{\dfrac{8}{15} + \dfrac{2}{5}i}$

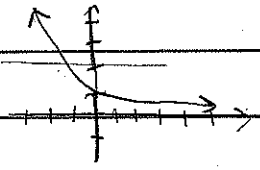
(59) $i^{21} = i^{20} \cdot i = (i^2)^{10} \cdot i$

$= (-1)^{10} \cdot i$

$= 1 \cdot i$ $\boxed{i}$

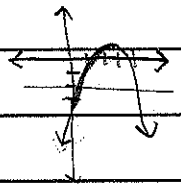
$= i$

(60) is the function one-to-one? **Yes**



passes the horizontal line test

(61) is the function one-to-one?



fails the horizontal line test. **NO**

(62) write in lowest terms

$$\frac{2x+2}{10x^2+16x+6} = \frac{2(x+1)}{2(5x^2+8x+3)}$$

$$= \frac{\cancel{2}(x+1)}{\cancel{2}(x+1)(5x+3)}$$

$$= \boxed{\frac{1}{5x+3}}$$

Side work

$5x^2+8x+3$ $\quad 3\cdot 5 = 15$, $3+5=8$

$5x^2+5x+3x+3$

$5x(x+1)+3(x+1)$

$(x+1)(5x+3)$

(63) $$\frac{y^2+8y+12}{y^2+14y+48}$$

$$= \frac{\cancel{(y+6)}(y+2)}{\cancel{(y+6)}(y+8)}$$

$$= \boxed{\frac{y+2}{y+8}}$$

Side work

$6\cdot 2 = 12$

$6+2=8$

$6\cdot 8 = 48$

$6+8=14$

(64) $\frac{2p-2}{p} \cdot \frac{7p^2}{4p-4}$

$\frac{2(p-1)}{p} \cdot \frac{7p^2}{4(p-1)}$

$\frac{7p}{2}$

$\boxed{\frac{7p}{2}}$

(65) $\frac{8r-24s}{3r-6s} \div \frac{12s-4r}{2r-4s}$

$\frac{2\cdot 4(r-3s)}{3(r-2s)} \cdot \frac{2(r-2s)}{4(3s-r)}$

$\frac{4(r-3s)}{3(3s-r)} = \frac{4(-1)(3s-r)}{3(3s-r)} = \frac{-4}{3}$

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

(66) $\frac{7x+7}{x} + \frac{3x-5}{7x}$

$\frac{7\cdot(7x+7)}{7\cdot x} + \frac{3x-5}{7x}$

$\frac{49x+49+3x-5}{7x}$

$\frac{52x+44}{7x}$

$\boxed{\frac{52x+44}{7x}}$

(67) $\frac{4x}{x+6} + \frac{2}{x-6}$

$\frac{4x(x-6)}{(x+6)(x-6)} + \frac{2(x+6)}{(x-6)(x+6)}$

$\frac{4x^2-24x+2x+12}{(x+6)(x-6)}$

$\boxed{\frac{4x^2-22x+12}{(x+6)(x-6)}}$

$\frac{4x^2-22x+12}{(x+6)(x-6)}$

also

$\frac{2(2x^2-11x+6)}{(x+6)(x-6}$

(68) $\frac{\frac{2m^7n^2}{5m}}{\frac{9m^3n^8}{4n^4}}$

$\frac{2m^7n^2}{5m} \div \frac{9m^3n^8}{4n^4}$

$\frac{2m^7n^2}{5m} \cdot \frac{4n^4}{9m^3n^8}$

$\frac{8m^7n^6}{45m^4n^8}$

$\frac{8m^3}{45n^2}$

$\boxed{\frac{8m^3}{45n^2}}$

(69) find the inverse of $f(x) = 8x + 5$

$y = 8x + 5$ ① replace $f(x)$ with y

$x = 8y + 5$ ② swap x + y

$-5 \quad -5$ ③ solve for y

$\frac{x-5}{8} = \frac{8y}{8}$

$\frac{x-5}{8} = y$ ④ replace y with $f^{-1}(x)$.

$f^{-1}(x) = \frac{x-5}{8}$

$\boxed{f^{-1}(x) = \frac{x-5}{8}}$

(70) write $2^3 = 8$ in logarithmic form

$\log_2 8 = 3$

$\boxed{\log_2 8 = 3}$

(71) write $\log_{14} 1 = 0$ in exponential form

$14^0 = 1$

$\boxed{14^0 = 1}$

(72) Choose the correct graph of

$f(x) = 3^x$

$\boxed{A}$

The graph rises from left to right above the x-axis because the base is a positive whole number

(73) Choose the correct graph of

$f(x) = \left(\frac{1}{4}\right)^x$

$\boxed{D}$

The graph falls from left to right aboves the x-axis because the base is a positive fraction

(74) Choose the correct graph of

$y = \log_4 x$ **A**

The graph rises on the right side of the y-axis from below the x-axis to above it because the base is a positive whole number.

(75) Choose the correct graph of

$y = \log_{1/8} x$ **D**

The graph falls on the right side of the y-axis from above the x-axis to below it because the base is a positive fraction.