ALG 2 Review
Unit 6-7-8

1. $\sqrt{98x^3}$

$\sqrt{98}\ \sqrt{x^3}$

$\sqrt{49}\sqrt{2}\ \ \sqrt{x^2}\sqrt{x}$

$7\ \sqrt{2}\ x\ \sqrt{x}$

$7x\sqrt{2x}$

2. $\frac{x+3}{3x} + \frac{2x-5}{x^2}$ ·3 ·3

$\frac{x^2+3x}{3x^2} + \frac{6x-15}{3x^2}$

$\frac{x^2+3x+6x-15}{3x^2}$

$\frac{x^2+9x-15}{3x^2}$ ← Factor/Simplify? No.

3. $(f-g)(x)$

$(3x^2-5) - (4x-7)$

$3x^2-5-4x+7$

$3x^2-4x+2$ ← Don't need to factor! It won't help simplify it.

4. $\frac{x^2-9}{5x+15} \cdot \frac{10x}{x^2-7x+12}$

$\frac{(x+3)(x-3)}{5(x+3)} \cdot \frac{2\,10x}{(x-4)(x-3)} = \frac{2x}{x-4}$

5. $3\sqrt{2}(\sqrt{6}+5\sqrt{2})$

$3\sqrt{12} + 15\sqrt{4}$

$3\sqrt{4}\sqrt{3} + 15\cdot 2$

$3\cdot 2\sqrt{3} + 30$

$6\sqrt{3}+30$

6. $f(x) = \frac{1}{3}x - 4$

$y = \frac{1}{3}x - 4$

$x = \frac{1}{3}y - 4$ Switch x, y solve for y

$3\cdot(x+4) = \left(\frac{1}{3}y\right)\cdot\frac{3}{1}$

$3x+12 = y$

$3x+12 = f^{-1}(x)$

7. $(\sqrt{5}-3)^2$

$(\sqrt{5}-3)(\sqrt{5}-3)$

$\sqrt{5}\sqrt{5} - 3\sqrt{5} - 3\sqrt{5} + 9$

$5 - 6\sqrt{5} + 9$

$14 - 6\sqrt{5}$

8. $(h \circ g)(x)$

$h(x) = 2x + 3$

$h \circ g = 2(\quad) + 3$

$= 2(x^2 - 5) + 3$

$= 2x^2 - 10 + 3$

$= 2x^2 - 7$

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9. Excluded Values?

$$\frac{4x}{6x^2 - 15x} = \frac{}{3x(2x-5)}$$

$3x = 0$ → $x \neq 0$

$2x - 5 = 0$

$+5 \quad +5$

$2x = 5$

$x \neq \frac{5}{2}$

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10. $\sqrt{12} + \sqrt{75}$ only ADD Like terms

$\sqrt{4}\sqrt{3} + \sqrt{25}\sqrt{3}$

$2\sqrt{3} + 5\sqrt{3}$

$= 7\sqrt{3}$

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11. $\frac{3x}{x^2+x-6} \div \frac{6x^2}{x^2+3x-10}$

$\frac{3x}{x^2+x-6} \cdot \frac{x^2+3x-10}{6x^2}$ ← SKip Switch FLIP

$\frac{3x}{(x+3)(x-2)} \cdot \frac{(x+5)(x-2)}{6x^2}$

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

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12. $f(x) = 5x^{-5}$

$g(x) = 2x + 4$

$h[f(-2)]$ ← Composition

SIDENOTE: $(h \circ f)(-2)$

$f(-2) = 3(-2)^2 - 5$

$= 3 \cdot 4 - 5$

$= 12 - 5$

$= 7$

$h[7]$

$= 2(7) + 4$

$= 14 + 4$

$= 18$

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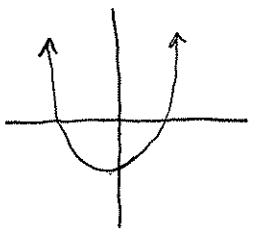
13. $f(x) = x^2 - 3$



Function? Look at graph vertical line test

YES!

D: $(-\infty, \infty)$ R $[-3, \infty)$

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14. $\sqrt[3]{56x^3y^5z^7}$

$\sqrt[3]{56}$ $\sqrt[3]{x^3}$ $\sqrt[3]{y^5}$ $\sqrt[3]{z^7}$

$\sqrt[3]{8}\sqrt[3]{7}$ $x^{3/3}$ $\sqrt[3]{y^3}\sqrt[3]{y^2}$ $\sqrt[3]{z^6}\sqrt[3]{z^1}$

$2\sqrt[3]{7}$ x $y\sqrt[3]{y^2}$ $z^{6/3}\sqrt[3]{z^1}$

$z^2\sqrt[3]{z^1}$

$2xyz^2\sqrt[3]{7y^2z}$

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15) $\frac{4x}{x-5} - \frac{x-3}{5-x}$

$\frac{4x}{x-5} - \frac{x-3}{-1(x-5)}$ Factor out -1

$\frac{-1 \cdot 4x}{-1 \cdot (x-5)} - \frac{x-3}{-1(x-5)}$ Get common denominator

$\frac{-4x}{-1(x-5)} - \frac{x-3}{-1(x-5)}$

$\frac{-4x - (x-3)}{-1(x-5)}$ write as 1 fraction (Distribute the $-$ sign)

$\frac{-4x - x + 3}{-1(x-5)}$

$\boxed{\frac{-5x+3}{-1(x-5)}}$ Factor/Simplify? NO

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16 $\frac{\sqrt{3}}{\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}} = \frac{\sqrt{18}}{\sqrt{36}} = \frac{\sqrt{18}}{6}$

$= \frac{\sqrt{9}\sqrt{2}}{6}$

$= \frac{3\sqrt{2}}{6}$

$\boxed{= \frac{\sqrt{2}}{2}}$

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17. $f(x) = -2|x-3| + 4$

3 right, 4 up

Start at (0,0) → (3,4)

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18. $\frac{\frac{2}{x} + 3}{\frac{5}{x} - 2}$

$\frac{\frac{2}{x} + \frac{3}{1}}{\frac{5}{x} - \frac{2}{1}} = \frac{\frac{2}{x} + \frac{3}{1} \cdot x}{\frac{5}{x} - \frac{2}{1} \cdot x}$

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

$\frac{3x+2}{\cancel{x}} \cdot \frac{\cancel{x}}{5-2x}$ SKIP SWITCH FLIP!!

$\boxed{\frac{3x+2}{5-2x}}$