Algebra 2: Cummulative Review Homework 12

1. Solve: $\left(-2\frac{2}{9}\right)w = 1\frac{3}{8}$

   (a.) $-\frac{99}{160}$ $-\frac{20}{9}w = \frac{11}{8}$
   b. $3\frac{1}{18}$
   c. $-3\frac{1}{18}$ $w = \frac{11}{8} \cdot \frac{-9}{20} = -\frac{99}{160}$
   d. $\frac{99}{160}$

2. Solve: $-\frac{4}{5}k + \frac{4}{5} = \frac{1}{2} + \frac{2}{3}k$

   (a) $\frac{9}{44}$ $30\left[-\frac{4}{5}k + \frac{4}{5}\right] = 30\left[\frac{1}{2} + \frac{2}{3}k\right]$
   b. $2\frac{1}{4}$
   c. $-\frac{9}{44}$ $-24k + 24 = 15 + 20k$
   d. $-\frac{39}{44}$ $24 = 15 + 44k$
   $9 = 44k$
   $k = 9/44$

3. Solve the inequality: $\frac{1}{5} + x + \frac{3}{5} \geq \frac{11}{15}$

   a. $x \leq \frac{1}{3}$ $15\left[\frac{1}{5} + x + \frac{3}{5}\right] \geq 15 \cdot \frac{11}{15}$
   b. $x \geq 1\frac{8}{15}$
   c. $x \geq \frac{1}{3}$ $3 + 15x + 9 \geq 11$
   (d) $x \geq -\frac{1}{15}$ $15x + 12 \geq 11$
   $15x \geq -1$
   $x \geq -\frac{1}{15}$

4. Factor completely: $5x^2 + 38x + 21 \rightarrow$ Factors of 21

   a. $(5x + 7)(x - 3)$ $(5x \quad)(x \quad)$
   (b.) $(5x + 3)(x + 7)$
   c. $(x + 3)(5x + 7)$ $(5x + 3)(x + 7)$
   d. $(5x + 3)(x - 7)$

5. Simplfy completely: $\frac{\sqrt[4]{810}}{\sqrt[4]{2}}$

   a. $3\sqrt{5}$ $\frac{\sqrt[4]{81 \cdot 10}}{\sqrt[4]{2}} = \frac{3\sqrt[4]{10}}{\sqrt[4]{2}}$
   (b.) $3\sqrt[4]{5}$
   c. $5\sqrt[4]{3}$
   d. $\sqrt[4]{162}$ $= 3\sqrt[4]{\frac{10}{2}} = 3\sqrt[4]{5}$

6. Simplify completely: $(-6i)(-6i)$

   a. 36 $= 36i^2 = 36(-1)$
   (b.) -36
   c. $-36i$ $= -36$
   d. $36i$

7. Simplify completely: $\left(\frac{12x^{19}y^9}{24x^{11}y^{13}}\right)^4$

   exponents:
   subtract + put
   where larger
   one sits

   a. $\frac{x^8}{16y^4}$ $\left(\frac{12}{24} \frac{x^{19}}{x^{11}} \cdot \frac{y^9}{y^{13}}\right)^4$
   (b.) $\frac{x^{32}}{16y^{16}}$ $\left(\frac{1}{2}x^8 \cdot \frac{1}{y^4}\right)^4$ (power +
   a power
   $\rightarrow$ multiply
   c. $\frac{x^{32}}{2y^{16}}$ $\left(\frac{1}{2}\right)^4 \frac{x^{8\cdot4}}{y^{4\cdot4}} = \frac{x^{32}}{16y^{16}}$
   d. $\frac{x^{32}y^{-16}}{16}$

8. Simplify completely: distribute
   negative
   $\left(15x^2 + 11xy - 19y^2\right) - \left(6x^2 - 3xy\right)$

   a. $9x^2 + 8xy - 19y^2$ $9x^2 + 14xy - 19y^2$
   (b.) $9x^2 + 14xy - 19y^2$
   c. $9x^2 - 11xy - 16y^2$
   d. $9x^2 - 14xy$

9. Simplify completely: $\frac{4}{23 + \sqrt{11}} \cdot \left(\frac{23 - \sqrt{11}}{23 - \sqrt{11}}\right)$

   a. $\frac{92 \div 4\sqrt{11}}{-518}$ $= \frac{4(23 - \sqrt{11})}{529 - 11}$
   b. $\frac{92 + 4\sqrt{11}}{518}$
   c. $\frac{23 - \sqrt{11}}{518}$ $= \frac{4(23 - \sqrt{11})}{518}$
   (d.) $\frac{92 - 4\sqrt{11}}{518}$

   (not reduced) $\frac{92 - 4\sqrt{11}}{518}$

   $= \frac{2 \cdot 2(23 - \sqrt{11})}{2 \cdot 259}$

   $= \frac{46 - 2\sqrt{11}}{259}$

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10. Find the missing value to complete the square.

$x^2 + 2x + \underline{\ 1\ }$

a. 2
b. 1
c. 4
d. 8

handwritten: $\frac{1}{2} \cdot 2 = 1$

$1^2 = 1$

11. Solve by any method: $16x^2 + 16x + 4 = 49$

a. $\{\frac{5}{4}, -\frac{9}{4}\}$
b. $\{\frac{9}{4}, -\frac{5}{4}\}$
c. $\{-\frac{1}{2}\}$
d. $\{-\frac{1}{2}, 7\}$

handwritten:
$16x^2 + 16x - 45 = 0$

$(4x - 5)(4x + 9) = 0$

$4x - 5 = 0 \qquad 4x + 9 = 0$
$4x = 5 \qquad\quad 4x = -9$
$x = \frac{5}{4} \qquad\quad x = -9/4$

(could also graph, 2nd calc zero)

12. Solve by any method: $(-2x^2 + x = 0)(-1)$

a. $\{1, 0\}$
b. $\{0, -0.5\}$
c. $\{0.5, 0\}$
d. $\{0\}$

handwritten:
$2x^2 - x = 0$

$x(2x - 1) = 0$

$x = 0 \qquad 2x - 1 = 0$
$\qquad\qquad 2x = 1$
$\qquad\qquad x = \frac{1}{2}$

13. Solve by any method: $3x^2 = 21$

a. $\sqrt{7}$
b. $\sqrt{7}, -\sqrt{7}$
c. $\frac{-\sqrt{21}}{3}, \frac{\sqrt{21}}{3}$
d. $-\sqrt{7}, \sqrt{21}$

handwritten:
$x^2 = 7$
$x = \pm\sqrt{7}$

14. Solve by any method: $2x^2 + 14x + 12 = 0$

a. $\{2, 12\}$
b. $\{-1, 12\}$
c. $\{2, -6\}$
d. $\{-6, -1\}$

handwritten:
$\frac{2(x^2 + 7x + 6)}{2} = \frac{0}{2}$

$x^2 + 7x + 6 = 0$

$(x + 6)(x + 1) = 0$

$x + 6 = 0 \qquad x + 1 = 0$
$x = -6 \qquad\quad x = -1$

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handwritten top:
$13 - 5x \geq 0$
$13 \geq 5x$
$\frac{13}{5} \geq x \qquad x \leq \frac{13}{5}$

$y \leq 2$ (graph flipped)

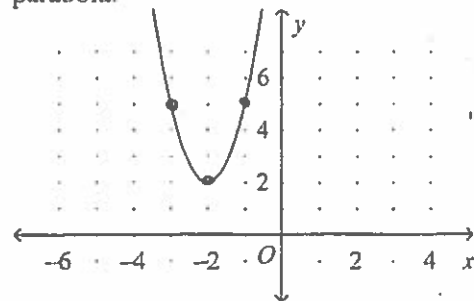15. State the domain and range of $y = -5\sqrt{13 - 5x} \div 2$

a. The domain is $x \leq \frac{13}{5}$ and the range is $y \leq 2$.
b. The domain is $x \leq \frac{13}{5}$ and the range is $y \geq 2$.
c. The domain is $x \geq \frac{13}{5}$ and the range is $y \geq 2$.
d. The domain is $x \leq \frac{13}{5}$ and the range is $y \leq 2$.

16. Use vertex form to write the equation of the parabola.

handwritten: vertex $(-2, 2)$ "3" family

a. $y = 3(x - 2)^2 + 2$
b. $y = 3(x - 2)^2 - 2$
c. $y = 3(x + 2)^2 + 2$
d. $y = (x + 2)^2 + 2$

17. Find the zeros of $f(x) = (x + 3)^2(x - 5)^6$ and state the multiplicity.

a. 2, multiplicity –3; 5, multiplicity 6
b. –3, multiplicity 2; 6, multiplicity 5
c. –3, multiplicity 2; 5, multiplicity 6
d. 2, multiplicity –3; 6, multiplicity 5

handwritten:
$x + 3 = 0$
$x = -3$ mult 2
$x - 5 = 0$
$x = 5$ mult 6

18. Solve $125x^3 + 343 = 0$. Find all complex roots.

a. $-\frac{7}{5}, \frac{35 \pm 35i\sqrt{3}}{50}$
b. no solution
c. $\frac{7}{5}, \frac{35 \pm 35\sqrt{3}}{50}$
d. $-\frac{7}{5}, \frac{7}{5}$

handwritten:
$(5x \quad 7)(25x^2 \quad 35x \quad 49) = 0$

$(5x + 7)(25x^2 - 35x + 49) = 0$

$5x + 7 = 0 \qquad\qquad\qquad set = 0$
$5x = -7$
$x = -7/5 \qquad x = \frac{35 \pm \sqrt{1225 - 4(25)(49)}}{2(25)}$

$x = \frac{35 \pm 35i\sqrt{3}}{50}$