56/56 = 100

# Foundations for College Algebra - MTWF
# University of North Georgia
# Fall 2017
# Exam #3

Name: Key Date: _____

For full credit ALL work must be shown NEATLY on the exam. Ten points will be deducted off the top for "messy" work! Any "valid" checks are worth an additional point per question.

FOLLOW DIRECTIONS! Ask if you are not sure what is being asked!

Simplify the following. Note: Make sure you are following the "correct" **Order of Operations** by showing **all** appropriate steps

Simplify the following rational expressions:

1.) $-\frac{70n^2}{28n} =$ $-\frac{5n}{2}$

2.) $\frac{v-5}{v^2-10v+25} = \frac{v-5}{(v-5)(v-5)} = \frac{1}{v-5}$

3.) $\frac{x^3-x^2-42x}{2x^2-20x+42} = \frac{x(x^2-x-42)}{2(x^2-10x+21)} = \frac{x(x-7)(x+6)}{2(x-7)(x-3)} =$ $\frac{x(x+6)}{2(x-3)}$ or $\frac{x^2+6x}{2x-6}$

Simplify the following completely.

8.) $\frac{1}{2}+\frac{1}{5}\cdot 3-\frac{1}{4}$

$\frac{1}{2}+\frac{3}{5}-\frac{1}{4}$

$\frac{10+12-5}{20}$

$\boxed{\frac{17}{20}}$

9.) $(3y^{-3})^{-2}$ $\quad 3^{-2}y^{6} = \frac{y^{6}}{3^{2}} = \boxed{\frac{y^{6}}{9}}$

Convert the given decimals in to fractions.

10.) 0.90 $= \frac{90}{100} = \boxed{\frac{9}{10}}$

11.) $0.\overline{25}$ $\quad$ let $x = 0.\overline{25}$

$100x = 25.\overline{25}$

$-\ x = 0.\overline{25}$

$99x = 25$

$\boxed{x = \frac{25}{99}}$

12.) Use the chart below to place a check mark indicating which sets the item on the left is a member of.

| | $\mathbb{N}$ | $\mathbb{W}$ | $\mathbb{Z}$ | $\mathbb{Q}$ | $\mathbb{Q}'$ | $\mathbb{R}$ |
|---|---|---|---|---|---|---|
| 2403 | ✓ | ✓ | ✓ | ✓ | | ✓ |
| $-\pi$ | | | | | ✓ | ✓ |
| $\frac{4}{3}$ | | | | ✓ | | ✓ |
| $-\sqrt{2}$ | | | | | ✓ | ✓ |

Solve the following rational equation:

4.) $\left(\frac{1}{n} = \frac{1}{5n} - \frac{n-1}{5n}\right)5n$

$5 = 1 - (n-1)$

$5 = 1 - n + 1$

$5 = 2 - n$

$3 = -n$

$\boxed{-3 = n}$

Check

$\frac{1}{-3} = \frac{1}{5(-3)} - \frac{(-3)-1}{5(-3)}$

$-\frac{1}{3} = -\frac{1}{15} - \frac{-4}{-15}$

$-\frac{1}{3} = -\frac{1}{15} - \frac{4}{15}$

$= \frac{-1-4}{15}$

$= \frac{-5}{15}$

$-\frac{1}{3} = -\frac{1}{3}$ ✓

Simplify the following radical expressions:

5.) $\sqrt{45p^3r^2}$

$\sqrt{9 \cdot 5 \cdot p^2 \cdot p \cdot r^2}$

$\boxed{3pr\sqrt{5p}}$

6.) $\sqrt{100x^3}$

$\sqrt{10^2 \cdot x^2 \cdot x}$

$\boxed{10x\sqrt{x}}$

Find the value of $c$ that completes the square.

7.) $p^2 - 14p + c$

(a) $-14 \cdot 1/2 = -7$

(b) $(-7)^2 = \boxed{49}$

"c"

Solve the following equations (for the specified variable).

13.) $g = 4ca - 3ba; for\ a$ (4 Points for Valid Check)

$g = a(4c - 3b)$

$$\frac{g}{4c-3b} = a$$

Check

$g = 4c\left(\frac{g}{4c-3b}\right) - 3b\left(\frac{g}{4c-3b}\right)$

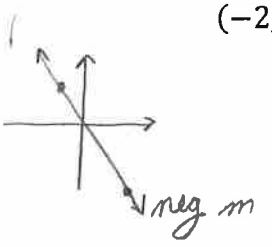
$= \frac{4cg}{4c-3b} - \frac{3bg}{4c-3b}$

$= \frac{4cg - 3bg}{4c-3b}$

$= \frac{g(4c-3b)}{(4c-3b)}$

$g = g$ ✓

14.) Write the equation in *Standard Form* of the line that passes through the points $(-2, 5)$ and $(6, -8)$.




$m = \frac{-8-5}{6+2} = \frac{-13}{8}$

$5 = -\frac{13}{8} \cdot -2 + b$

$5 = \frac{13}{4} + b$

$\frac{5}{1} - \frac{13}{4} = b$

$\frac{20-13}{4} = b$

$\frac{7}{4} = b$

$8\left(y = -\frac{13}{8}x + \frac{7}{4}\right)$

$8y = -13x + 14$

$13x + 8y = 14$

Check

$13(6) + 8(-8) = 14$

$78 - 64 = 14$

$14 = 14$ ✓

Bonus (5 points). Show that $h = \frac{d}{c-5}$ is the solution of $c = 5 + \frac{d}{h}$ by substituting in $\frac{d}{c-5}$ for $h$ in the equation. DO NOT just solve the equation for $h$!

$c = 5 + \frac{d}{\frac{d}{c-5}}$

$= 5 + \frac{d}{1} \cdot \frac{c-5}{d}$

$= 5 + c - 5$

$c = c$ ✓