BECA/Huson/Algebra 2: Regents Preparation
24 May 2024

Name: SOLUTIONS

Prep #17 Final Exam: Algebra **No calculators**

1. Perform the operations and simplify the expression. N.RN.3 Rational numbers

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

   (b) $\frac{1}{6}+\frac{1}{3}=$ $\frac{1}{2}$

   (c) $\frac{3}{4}+\frac{1}{2}=$ $1\frac{1}{4}$

   (d) $\frac{2}{3}-\frac{1}{2}=$ $\frac{1}{6}$

   (e) $\frac{7}{8}-\frac{3}{4}=$ $\frac{1}{8}$

   (f) $\frac{1}{3}-\frac{1}{4}=$ $\frac{1}{12}$

2. Convert between fractions and percentages.

   (a) $\frac{1}{5}=$ 20%

   (b) $\frac{3}{4}=$ 75%

   (c) $\frac{1}{3}=$ $33\frac{1}{3}\%$

   (d) $25\%=$ $1/4$

   (e) $66\frac{2}{3}\%=$ $2/3$

   (f) $80\%=$ $4/5$

3. Round to the accuracy stated.

   (a) nearest tenth: 72.75
   72.8

   (b) nearest thousandth: 0.13749
   0.137

   (c) nearest tenth: 19.1725
   19.2

   (d) nearest hundredth: 10.9955
   11.00

4. Write each expression in standard form.

   (a) $5x-3x^2+8x^2+7$
   $=5x^2+5x+7$

   (b) $2(3x+y)(x-4y)$
   $=6x^2-22xy-8y^2$

5. Simplify. (assume $x > 0$) N.RN.2 Properties of exponents

(a) $x^2 \cdot x^3 =$ x^5

(c) $\sqrt[3]{x^6} =$ x^2

(b) $\frac{x^{\frac{2}{3}}}{x^{\frac{1}{6}}} =$ $x^{\frac{1}{2}} = \sqrt{x}$

(d) $\frac{\sqrt{36x^6}}{\sqrt[3]{27x^6}} =$ $2x$

6. Simplify each complex expression to the form $a + bi$. N.CN.2 Complex numbers

(a) $(11 - 2i) - (6 - 7i) =$

$5 + 5i$

(b) $(6 + 3i)(1 - 4i) =$

$= 6 - 24i + 3i - 12i^2$

$= 18 - 21i$

7. Solve for x over the complex numbers using the quadratic formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x^2 - 4x + 13 = 0$ REI.4 Solve quadratic equations

$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(13)}}{2}$

$= \frac{4}{2} \pm \frac{\sqrt{16 - 52}}{2} = 2 \pm 3i$

8. Solve algebraically for all values of x given REI.2 Solve radical equations

$\sqrt{x + 12} = x$

$x + 12 = x^2$

$x^2 - x - 12 = 0$

$(x - 4)(x + 3) = 0$

$x = 4, -3$

check $\sqrt{(4) + 12} = (4)$?

$\sqrt{16} = 4$ ✓

$\sqrt{(-3) + 12} = (-3)$?

$\sqrt{9} \neq -3$ reject -3

$x = 4$