

Pre-Calculus Summer Review ANSWER KEY

Factoring Polynomials

- $(4m^2 + 3n)(3m^2 - 3n)$
- $(1 - 6b)(1 + 6b + 36b^2)$
- $(x + 5)(x + 7)$
- $(x^2 - 6)(x + 2)(x - 2)$
- $(2x + 1)(5x - 6)$
- $(3k + 4)(3k + 2)$
- $(4m^2 + 3)(m - 3)$
- $4(2x^2 - 5)(3x + 2)$
- $-k(k + 4)(k^2 - 4k + 16)$
- $7p^3(p - 3)(p + 2)$
- $(2n + 1)(2n - 1)(7n - 3)$
- $5(4x + 1)(x - 6)$

Operations with Exponents

- $\frac{36q}{p^5}$
- $\frac{4ab^9}{c^9}$
- $\frac{16a^{24}}{b^{12}}$
- $-\frac{x^9}{4y^8}$
- $123m^{10}n^8$
- $-\frac{7}{x^{10}}$

Operations with Radicals

- $5a^3b^4c\sqrt{5c}$
- $-4p^2q\sqrt[3]{3q}$
- $2\sqrt[4]{24}$
- $-7x^2\sqrt[3]{4x}$
- $3y^2\sqrt{5y}$
- $4 + 13\sqrt{2}$
- $\sqrt{5}$
- $\frac{-4-5\sqrt{2}}{2}$
- $-2 + \sqrt{6}$
- $\frac{10-15\sqrt{3}+6\sqrt{2}-9\sqrt{6}}{23}$
- $k^{\frac{3}{2}}$ and $k\sqrt{k}$
- $p^{\frac{7}{4}}$ and $p\sqrt[4]{p^3}$
- $m^{\frac{5}{3}}$ and $m\sqrt[3]{m^2}$
- $x^{\frac{21}{4}}$ and $x^5\sqrt[4]{x}$

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Operations with Complex Numbers

1. $14i$

2. $4i\sqrt{5}$

3. $-2\sqrt{15}$

4. i

5. $15i$

6. $-384i$

7. $-1 - 6i$

8. $-19 - 11i$

9. $13 + 50i$

10. $11 - 60i$

11. $\frac{2+7i}{6}$

12. $\frac{11-13i}{5}$

Operations with Rational Expressions

1. $\frac{m+2}{4(m-4)}$

2. $-\frac{7}{n+6}$

3. $\frac{(x-1)^2}{x-3}$

4. $\frac{3(k^2-4k+8)}{(k-6)(k+4)}$

5. $\frac{19(h+1)}{2(5h+4)}$

6. $\frac{60}{4x-19}$

Linear Equations and Inequalities

1. $m = -7$

2. $x = -\frac{11}{3}$

3. All Real Numbers

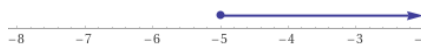
4. No Real Solution

5. $x = \frac{180l}{\pi r}$

6. $a = \pm\sqrt{3c-b}$

7. $x < -5$ or $(-\infty, -5)$

8. $x \geq -5$ or $[-5, \infty)$



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Absolute Value Equations and Inequalities

1. $p = \{0, 4\}$

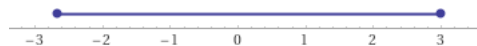
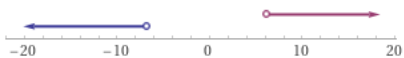
2. $x = \left\{-1, \frac{3}{4}\right\}$

3. $r = \{6\}$

4. No Real Solution

5. $x < -\frac{47}{7}$ or $x > \frac{43}{7}$ $\left(-\infty, -\frac{47}{7}\right) \cup \left(\frac{43}{7}, \infty\right)$

6. $-\frac{8}{3} \leq k \leq 3$ $\left[-\frac{8}{3}, 3\right]$



Quadratic Equations

1. $n = \left\{-1, \frac{6}{5}\right\}$

2. $y = \left\{\frac{1}{3}, \frac{7}{5}\right\}$

3. $k = \{\pm 2\sqrt{10}\}$

4. $w = \left\{\pm \frac{2i\sqrt{15}}{3}\right\}$

5. $v = \{-8 \pm \sqrt{11}\}$

6. $w = \{1 \pm 2\sqrt{3}\}$

7. $n = \left\{\frac{-3 \pm i\sqrt{5}}{4}\right\}$

8. $r = \{5 \pm 3\sqrt{3}\}$

Radical Equations

1. $x = \{5\}$

2. $a = \{6\}$

3. $m = \{-5\}$

4. $x = \{7\}$

5. $x = \{2\}$

6. No Solution

Rational Equations

1. $w = \left\{\frac{5}{2}, 4\right\}$

2. $n = \left\{\frac{1}{3}\right\}$

3. $x = \{-1, 6\}$

4. $k = \left\{-\frac{13}{5}\right\}$

5. $m = \{\pm 6\}$

6. $a = \left\{\frac{1}{3}\right\}$

Pre-Calculus Summer Review ANSWER KEY

Domain and Range

- D: $\{-5, -3, 0, 4\}$
R: $\{-2, -1, 7\}$
Not a Function
- D: $\{-6, -3, 0, 1, 4\}$
R: $\{-5, -2, 4, 5, 7\}$
Function
- D: $\{-3, -2, -1\}$
R: $\{-9, -6, -1\}$
Not a Function
- D: $(-\infty, \infty)$ or \mathbb{R}
R: $(-5, \infty)$ or $\{y|y > -5\}$
Function
- D: $(-\infty, 7]$ or $\{x|x \leq 7\}$
R: $(-\infty, 0]$ or $\{y|y \leq 0\}$
Function
- D: $(-\infty, -4) \cup (-4, \infty), \{x|x \neq -4\}$
R: $(-\infty, 2) \cup (2, \infty), \{y|y \neq 2\}$
Function
- D: $[-3, 5]$ or $\{x|-3 \leq x \leq 5\}$
R: $[-4, 4]$ or $\{y|-4 \leq y \leq 4\}$
Not a Function
- D: $(-\infty, \infty)$ or \mathbb{R}
R: $[-3, 3]$ or $\{y|-3 \leq y \leq 3\}$
Function
- D: $(-\infty, -1) \cup (-1, \infty), \{x|x \neq -1\}$
R: $(-\infty, -4) \cup (-4, \infty), \{y|y \neq -4\}$
Function
- D: $(-\infty, \infty)$ or \mathbb{R}
R: $(-\infty, \infty)$ or \mathbb{R}
- D: $(-\infty, \infty)$ or \mathbb{R}
R: $(-\infty, \infty)$ or \mathbb{R}
- D: $(-\infty, \infty)$ or \mathbb{R}
R: $[0, \infty)$ or $\{y|y \geq 0\}$
- D: $(-\infty, \infty)$ or \mathbb{R}
R: $[-6, \infty)$ or $\{y|y \geq -6\}$
- D: $(-\infty, \infty)$ or \mathbb{R}
R: $[0, \infty)$ or $\{y|y \geq 0\}$
- D: $(-\infty, \infty)$ or \mathbb{R}
R: $(-\infty, 2]$ or $\{y|y \leq 2\}$
- D: $[0, \infty)$ or $\{x|x \geq 0\}$
R: $[0, \infty)$ or $\{y|y \geq 0\}$
- D: $[-2, \infty)$ or $\{x|x \geq -2\}$
R: $[9, \infty)$ or $\{y|y \geq 9\}$
- D: $(-\infty, \infty)$ or \mathbb{R}
R: $(-\infty, \infty)$ or \mathbb{R}
- D: $(-\infty, \infty)$ or \mathbb{R}
R: $(-\infty, \infty)$ or \mathbb{R}
- D: $(-\infty, 0) \cup (0, \infty), \{x|x \neq 0\}$
R: $(-\infty, 0) \cup (0, \infty), \{y|y \neq 0\}$
- D: $(-\infty, 1) \cup (1, \infty), \{x|x \neq 1\}$
R: $(-\infty, -5) \cup (-5, \infty), \{y|y \neq -5\}$

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Function Notation

1. $f(3) = 1$

2. $g(5) = 15$

3. $p(-8) = -\frac{17}{4}$

4. $h(-3) = \frac{1}{16}$

5. $j(3x + 2) = -9x^2 - 21x$

6. $k(-3w) = \frac{2w-5}{w-3}$

Finding Intercepts

1. x: $(-2, 0), (8, 0)$

2. x: $(1, 0), (\frac{7}{3}, 0)$

y: $(0, 2)$

y: $(0, 3)$

3. x: $(-\frac{1}{2}, 0), (4, 0)$

4. x: $(0, 0), (4, 0), (6, 0)$

y: $(0, -4)$

y: $(0, 0)$

5. x: $(3, 0)$

6. x: $(4, 0)$

y: $(0, \sqrt{6} - 3)$

y: None

7. x: $(-\frac{2}{3}, 0)$

8. x: $(-\frac{18}{5}, 0)$

y: $(0, -2)$

y: $(0, \frac{9}{2})$