(40)

Algebra II Chapter 8 Test

Name: Key

List all the possible rational zeros for each function.

1 1. $f(x) = x^3 + 6x + 2$ $\pm 1 \quad \pm 2$

1 2. $f(x) = 3x^3 = 5x^2 - 11x + 3$ $\pm 1, \pm 3, \pm \frac{1}{3}$

State the number of positive real zeros and negative real zeros.

2 3. $f(x) = 5x^3 + 8x^2 - 4x + 3$ 2 or 0 Pos
1 Neg

2 4. $f(x) = x^4 + x^3 + 2x^2 - 3x - 1$ 1 Pos
3 or 1 Neg

Find all the rational zeros for each function. Show possible roots, number of possible positive and negative roots.

6 5. $f(x) = x^3 + 3x^2 - 6x - 8$

$\pm 1, \pm 2, \pm 4, \pm 8$ $2, -1, -4$
1 Pos
2 or 0 Neg

6 6. $f(x) = x^3 + 7x^2 + 7x - 15$

$\pm 1, \pm 3, \pm 5, \pm 15$ $1, -3, -5$
1 Pos
2 or 0 Neg

(18)

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$\pm 1, \pm 2, \pm 4, \pm 8$
1 Pos
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2, -1, -4

6 6. $f(x) = x^3 + 7x^2 + 7x - 15$

$\pm 1, \pm 3, \pm 5, \pm 15$
1 Pos
2 or 0 Neg

1, -3, -5

(18)

7. $f(x) = x^4 - 4x^3 - 7x^2 + 34x - 24$

$\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 8, \pm 12, \pm 24$

3 or 1 Pos

1 Neg

1, 2, 4, -3

8. What is the most times $f(x) = -3x^3 + 5x^2 - x + 3$ can cross the x-axis?

3 @ Most

9. $f(x) = x^2 - 2x + 1$

a) Find $f(-2)$ $= \boxed{9}$

b) Find $f(x+h)$ $(x+h)^2 - 2(x+h) + 1$

$\boxed{x^2 + 2xh + h^2 - 2x - 2h + 1}$

10. $f(x) = x^2 - 4$ and $g(x) = 4x - 1$

a) Find $f(g(x)) = (4x-1)^2 - 4$

$16x^2 - 8x + 1 - 4 = \boxed{16x^2 - 8x - 3}$

b) Find $g(f(x))$

$4(x^2-4) - 1$

$4x^2 - 16 - 1$

$\boxed{4x^2 - 17}$

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2 11. Determine whether f(x) = 3x – 4 and g(x) = (x + 4)/3 are inverse functions

$f(g(x)) = 3\left(\frac{x+4}{3}\right) - 4$ $\quad g(f(x)) = \frac{(3x-4)+4}{3} = x$

$= x$ $\quad \therefore$ Inverse

12. Find the inverse function

1 a) $y = 4x$ $\quad x = 4y \quad y = \frac{1}{4}x$

$f^{-1}(x) = \frac{1}{4}x$

1 b) $f(x) = (2x-1)/3$ $\quad x = \frac{2y-1}{3}$ $\quad 3x = 2y - 1$

$2y - 1 = 3x$

$2y = 3x + 1$

$y = \frac{3x+1}{2}$

$f^{-1}(x) = \frac{3x+1}{2}$

1 c) $f(x) = (x-4)^2$

$x = (y-4)^2$

$y - 4 = \pm\sqrt{x}$

$x = 4 \pm \sqrt{x}$

$f^{-1}(x) = 4 \pm \sqrt{x}$

1 13. If you graphed the above functions and their inverses on the same graph what would you notice about the two graphs?

Symmetric about the line $y = x$

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