

## Unit 3 Day 1 Exit Ticket

Simplify.

$$1) 4\sqrt{-24} = 4 \cdot 2 \cdot i\sqrt{6}$$

$$\begin{array}{l} \diagup \diagdown \\ -1 \cdot 4 \cdot 6 \end{array} = \boxed{8i\sqrt{6}}$$

$$2) -9\sqrt{-200}$$

$$-9 \cdot 10 \cdot i\sqrt{2}$$

$$\boxed{-90i\sqrt{2}}$$

$$3) (5+i) - (-5-4i)$$

$$5+i+5+4i$$

$$\boxed{10+5i}$$

$$4) (7+5i)(-8-4i)$$

$$-56 - 28i - 40i - 20i^2$$

$$+20$$

$$\boxed{-36-68i}$$

$$5) 2(-3i) + 8(1+7i)$$

$$-6i + 8 + 56i$$

$$\boxed{50i+8}$$

$$6) 8(-i) - (i)(-7-i)$$

$$-8i + 7i + i^2$$

$$\boxed{-i-1}$$

## Unit 3 Day 2 Exit Ticket

Solve each equation by the appropriate method.

1)  $9n^2 - 8 = -9$

$$9n^2 = -1$$

$$\sqrt{n^2} = \sqrt{-\frac{1}{9}} \quad \boxed{n = \pm \frac{1}{3}i}$$

2)  $-4k^2 + 6k = -5k^2 + 7$

$$k^2 + 6k - 7 = 0$$

$$(k-1)(k+7) = 0$$

$$\boxed{k=1, -7}$$

3)  $k^2 + 2k = 3$

$$k^2 + 2k - 3 = 0$$

$$(k-1)(k+3) = 0$$

$$\boxed{k=1, -3}$$

4)  $v^2 = 9v + 5$

$$v^2 - 9v - 5 = 0$$

$$v = \frac{9 \pm \sqrt{81 - 4(1)(-5)}}{2}$$

$$= \frac{9 \pm \sqrt{101}}{2}$$

Unit 3 Day 3 Exit Ticket

Answer the following questions about each function.

1.  $y = -2x^3 + x - 1$

Degree: 3

Leading Coefficient: -

L as  $x \rightarrow -\infty, y \rightarrow +\infty$

R as  $x \rightarrow +\infty, y \rightarrow -\infty$

2.  $y = x^4 + x^3 - 2x$

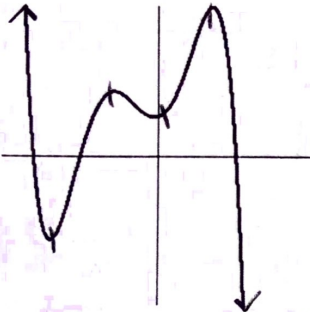
Degree: 4

Leading Coefficient: +

L as  $x \rightarrow -\infty, y \rightarrow +\infty$

R as  $x \rightarrow +\infty, y \rightarrow +\infty$

3. According to the graphs, state the degree AND the number of positive, negative, and imaginary roots.



degree: 5 4+1

positive: 1

negative: 2

imaginary: 2

Unit 3 Day 4 Exit Ticket

Questions:	Answers:	Graph:
degree	<u>5</u> <u>4+1</u>	
# of zeros	<u>5</u>	
L $x \rightarrow -\infty$	<u><math>-\infty</math></u>	
R $x \rightarrow +\infty$	<u><math>+\infty</math></u>	
list the zeros	<u>-7, 0 (d.r.), 3, 9</u>	
equation	<u><math>y = (x+7)(x^2)(x-3)(x-9)</math></u>	



Unit 3 Day 6 Exit Ticket

Divide using long division.

1)  $(b^3 + 6b^2 - 11b - 27) \div (b + 7)$

$$\begin{array}{r}
 b^2 - b - 4 + \frac{1}{b+7} \\
 b+7 \overline{) b^3 + 6b^2 - 11b - 27} \\
 \underline{(-) b^3 + 7b^2} \phantom{- 27} \\
 -b^2 - 11b - 27 \phantom{- 27} \\
 \underline{(-) -b^2 - 7b} \phantom{- 27} \\
 -4b - 27 \\
 \underline{(-) -4b - 28} \\
 1
 \end{array}$$

2)  $(-46k^3 + 7k^4 - 21k + 24 - 25k^2) \div (7k - 4)$

ORDER!

$$\begin{array}{r}
 k^4 - 6k^3 - 7k - 7 \\
 7k-4 \overline{) 7k^4 - 46k^3 - 25k^2 - 21k + 24} \\
 \underline{(-) 7k^4 - 4k^3} \phantom{- 21k + 24} \\
 -42k^3 - 25k^2 - 21k + 24 \\
 \underline{(-) -42k^3 + 24k^2} \phantom{- 21k + 24} \\
 -49k^2 - 21k + 24 \\
 \underline{(-) -49k^2 + 28k} \phantom{- 24} \\
 -49k + 24 \\
 \underline{(-) -49k + 28} \\
 -4
 \end{array}$$

Divide using synthetic division.

3)  $(x^4 + 7x^3 - 4x^2 - 53x + 51) \div (x + 6)$

$$\begin{array}{r}
 -6 \overline{) 1 \quad 7 \quad -4 \quad -53 \quad 51} \\
 \underline{-6 \quad -6 \quad 60 \quad -42} \\
 1 \quad 1 \quad -10 \quad 7 \quad 9
 \end{array}$$

$$\boxed{x^3 + x^2 - 10x + 7 + \frac{9}{x+6}}$$

4)  $(k^5 - 3k^4 - 2k + 12) \div (k - 3)$

$$\begin{array}{r}
 3 \overline{) 1 \quad -3 \quad 0 \quad 0 \quad -2 \quad 12} \\
 \underline{3 \quad 0 \quad 0 \quad 0 \quad -6} \\
 1 \quad 0 \quad 0 \quad 0 \quad -2 \quad 6
 \end{array}$$

$$\boxed{k^4 - 2 + \frac{6}{k-3}}$$

Unit 3 Day 7 Exit Ticket

Evaluate each function at the given value.

1)  $f(a) = a^4 - 7a^3 + 13a^2 - 4a - 1$  at  $a = 4$

$$\begin{aligned}
 f(4) &= 4^4 - 7(4)^3 + 13(4)^2 - 4(4) - 1 \\
 &= \boxed{-1}
 \end{aligned}$$

2)  $f(x) = x^5 - 20x^3 + 19x^2 - 34x - 9$  at  $x = -5$

$$\begin{array}{r}
 -5 \overline{) 1 \quad 0 \quad -20 \quad 19 \quad -34 \quad -9} \\
 \underline{-5 \quad 25 \quad -25 \quad 30 \quad 20} \\
 1 \quad -5 \quad 5 \quad -6 \quad -4 \quad 11
 \end{array}$$

$$\boxed{f(-5) = 11}$$

Find all roots. One root has been given.

3)  $x^5 + 5x^4 - x^3 - 5x^2 - 56x - 280 = 0$ ;  $-5$

$$\begin{array}{r}
 -5 \overline{) 1 \quad 5 \quad -1 \quad -5 \quad -56 \quad -280} \\
 \underline{-5 \quad 0 \quad 5 \quad 0 \quad 280} \\
 1 \quad 0 \quad -1 \quad 0 \quad -56 \quad 0
 \end{array}$$

$$\boxed{x^4 - x^2 - 56 = (x^2 + 7)(x^2 - 8)}$$

4)  $x^4 + x^3 - 19x^2 + x - 20 = 0$ ;  $-5$

$$\begin{array}{r}
 -5 \overline{) 1 \quad 1 \quad -19 \quad 1 \quad -20} \\
 \underline{-5 \quad 20 \quad -5 \quad 20} \\
 1 \quad -4 \quad 1 \quad -4 \quad 0
 \end{array}$$

$$\boxed{x^3 - 4x^2 + (x - 4) = 0}$$

$$\boxed{x^2(x - 4) + 1(x - 4) = 0}$$

$$\boxed{x = -5, 4, \pm i}$$

$$\boxed{x = -5, \pm 2\sqrt{2}, \pm i\sqrt{7}}$$