- 1. The equation  $h = 241m^{-\frac{1}{4}}$  predicts a mammal's heart rate, h, in beats per minute, based on it's mass, m, in kilograms. What is the predicted heart rate, in beats per minute, of a polar bear with a mass of 326 kilograms?
  - A 57
  - B 67
  - C 82
  - D 92
- 2. What is the logarithmic form of the equation  $y = 20^{-\frac{3}{2}}$ ?
  - A  $\log_{20} y = -\frac{3}{2}$
  - $B \qquad \log_{\frac{3}{2}} 20 = y$
  - $C \qquad {}^{-}\log_{\frac{3}{2}}y = 20$
  - $\mathbf{D} \qquad \log_{20} \left( \frac{-3}{2} \right) = y$

3. What are the values of *x* and *y* when (3-2i) - (x + yi) = (2 - 3i)? Α x = 1, y = ix = 1, y = iВ С x = 1, y = 5x = 1, y = 1D Simplify:  $\frac{1+2i}{2-3i}$ 4.  $\frac{8+i}{7}$ А  $\frac{-4+7i}{13}$ В  $\frac{8+7i}{7}$ С D  $^{-4} + 7i$ 

5. Simplify: 
$$\frac{\frac{1}{x}+1}{\frac{1}{x}-1}$$
  
A  $\frac{1+x}{1-x}$   
B  $\frac{1-x}{1+x}$   
C  $\frac{1}{x}$   
D  $-1$ 

Expand: 
$$(x + y)^4$$
  
A  $x^4 + y^4$   
B  $x^4 + 4xy + y^4$   
C  $x^4 + 4x^3y + 4x^2y^2 + 4xy^3 + y^4$ 

6.

D  $x^4 + 4x^3y + 6x^2y^2 + 4xy^3 + y^4$ 

7. Matrix G shows the gallons of milk sold at a dairy over a two-week period. Matrix D shows the dollar amount per gallon.

		<b>Gallons of Milk Sold</b>		
		Whole	Low Fat	Skim
<b>G</b> =	Week 1		450	102
	Week 2	194	530	127

		Dollar Amount per Gallon		
		Revenues	Advertising Fee	
	****	(φ)	$(\psi)$	
	Whole	2.89	0.29	
<b>D</b> =	Low Fat	2.79	0.32	
	Skim	2.69	0.35	

If matrix P is the product of G and D, which element in matrix P represents the total advertising fees for Week 1?

$$P = G \times D = \begin{bmatrix} p_{11} & p_{12} \\ p_{21} & p_{22} \end{bmatrix}$$

A  $p_{11}$ 

- B  $p_{21}$
- $C p_{12}$
- $\mathbf{D} \quad p_{22}$

## End of Goal 1 Sample Items

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## Goal 1

1.	<b>Objective 1.01</b> Simplify and perform operations with rational exponents and logarithms (common and natural) to solve problems.					
	Thinking Skill:	Integrating	<b>Correct Answer:</b>	А		
2.	<b>Objective 1.01</b> Simplify and performand natural) to sole <b>Thinking Skill:</b>	-	ational exponents and Correct Answer:	logarithms (common A		
3.	<b>Objective 1.02</b> Define and compu <b>Thinking Skill:</b>	te with complex numb Applying	oers. <b>Correct Answer:</b>	D		
4.	<b>Objective 1.02</b> Define and comput <b>Thinking Skill:</b>	te with complex numb Applying	oers. <b>Correct Answer:</b>	В		
5.	<b>Objective 1.03</b> Operate with algebraic solve problems. <b>Thinking Skill:</b>	braic expressions (pol Applying	ynomial, rational, com <b>Correct Answer:</b>	plex fractions) to A		
6.	solve problems.	braic expressions (pol Applying	ynomial, rational, com Correct Answer:	plex fractions) to D		
7.	<b>Objective 1.04</b> Operate with math <b>Thinking Skill:</b>	rices to model and solv Integrating	~	С		