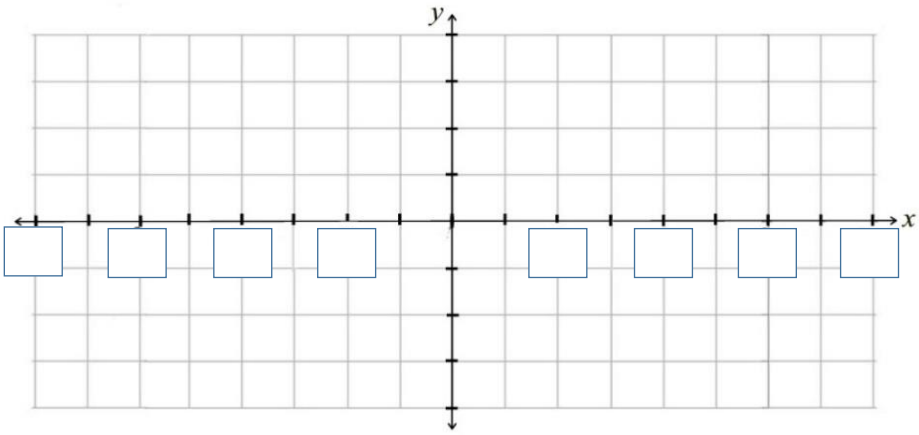
Fab Five 2nd Semester Review Advanced Math

Chapter 6

1. Graph $y = 3 + 2\cos(3x + \frac{3\pi}{2})$



Period =

Phase shift =

Amplitude =

Vertical Shift =

3. Identify the domain for the functions sin x, cos x, tan x, csc x, sec x, and cot x.

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Chapter 7

1. Prove $\frac{\cos x + 1}{\tan^2 x} = \frac{\cos x}{\sec x - 1}$

2. Using the formula for cos (x + y)… find the cos 105 degrees.

3. Solve $2 \sin^2 x + \sin x - 1 = 0$

   Principal values =

   $0 \leq x \leq 360$ =

4. Using the formula sin 2x = 2sinx cosx find sin 2x if $270 \leq x \leq 360$ and sin x = -3/4.

5. $\tan(\cos^{-1}(-\frac{\sqrt{3}}{2}))$ Quadrant 2.

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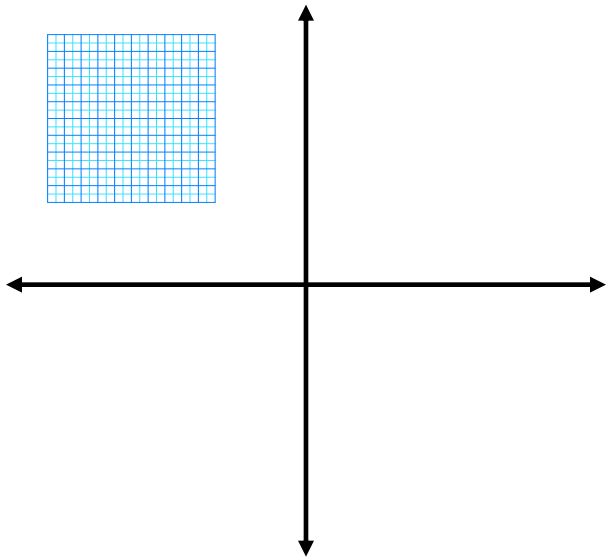
Chapter 8

1. A boat is set to travel at a speed of 12 knots in the direction 50° west of north. The current is moving at a speed of 10 knots in the direction 4° south of east. Find the *x* and *y* components of the vector representing the boat's actual velocity relative to the land.

2. Graph the line represented by the parametric equations:

   $x = 2 + 3t$

   $y = -4 + 8t$



3. Given the formula $\cos x = \dfrac{\vec{u} \bullet \vec{v}}{\|\vec{u}\|\|\vec{v}\|}$, find the angle, *x*, between ***u*** and ***w***.

   u = (-4,2) **w** = (-3,-4)

4. Find the magnitude **<u>and</u>** direction of the vector (-6,2).

5. Find two vectors perpendicular to the vector (5 , -7)

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Chapter 11

1. Solve. $\log\ 0.1^{(2x+8)} \geq \log 7^{(x+4)}$

2. Solve. $e^{2x} > 20$

3. Find the balance after 11 years for a $7,500 investment earning 4.5% interest compounded continuously.

4. Solve using log properties: $\log_4 3 + \log_4 x = \log_4 45$

5. Solve: $6^{(x-2)} = 30$

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Chapter 15A

1. Find the 2nd derivative of $y = -3x^5 + 7x^2 - 12x + 5$.

2. Find the derivative of $\frac{x^2-2x}{e^x}$

3. Find the instantaneous velocity and instantaneous acceleration of an object travelling on the path of $y = 4x^3 + 2x^2 - 5x + 4$ at $x = 2\ seconds$.

4. Evaluate $\lim_{x \to 3} \frac{x^2-3x-10}{x-5}$

5. Find the derivative of $y = \ln(\sin(4x + 2))$.

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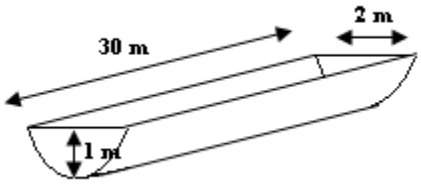
Chapter 15B

1. A car accelerates at from 20mph to 80mph in 10 seconds. How far did the car travel in 10 seconds.

2. Evaluate $\int_{-1}^{5}(x^2+1)dx$

3. A construction firm needs to fill in a parabolic trench that is 30 meters long. How much soil will the company need to completely fill the trench if its dimensions are 1 meter deep by 2 meters wide? Show all work!



4. Evaluate $\int_{-2}^{3}(x^2+2x)dx$

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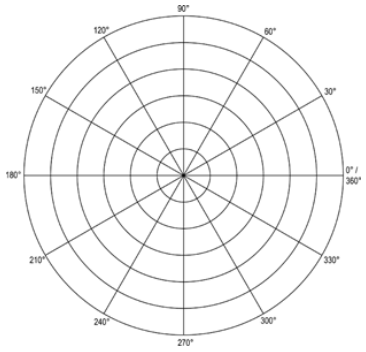
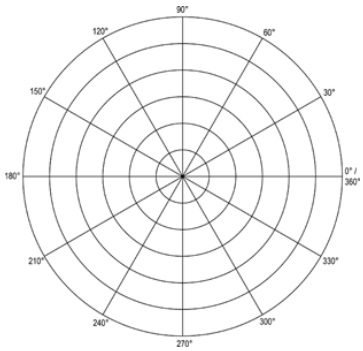
Chapter 9

1. Write (1, 5) in polar form.

2. Graph: r = 4



3. Graph: $\theta = \frac{2\pi}{3}$



4. Write $[-4, 75°]$ in rectangular form.

5. Find the distance between the two points with the given polar coordinates:

   $P_1[5, 140^o]$ and $P_2[3, -115^o]$