## Warm-up:

*Test Thursday!*

1) Solve for x by factoring: $2x^2 + 3x = 5$

2) Simplify: $\dfrac{7+i}{6-i} = \dfrac{43+13i}{37}$

3) Solve using the quadratic forumula:
$x^2 - x - 4 = -8$

4) $f(x) = -2(x+3)^2 - 6$
Find vertex, focus and directrix

5) Write the Equation of the Circle and identify the center and radius $x^2 + 12x + y^2 - 14y = 15$

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8  The diameter of a circle is 8 centimeters. A central angle of the circle intercepts an arc of 12 centimeters. What is the radian measure of the angle?

A  $\dfrac{3}{2}$

B  3

C  4

D  $8\pi$

$d = 8\,cm \quad arc = 12$

$\theta$ in radians? $\pi$ in the num

$D \to R \quad \dfrac{\pi}{180}$

arc length $= \dfrac{2\pi r \theta}{360}$

arc length $= r\theta$

$\dfrac{12}{4} = \dfrac{4\theta}{4}$

$\theta = 3$

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** ___Series___ : expression for the sum of the terms of a sequence.

**--Arithmetic Series:**

notation for series — $S_n = \frac{n}{2}(a_1 + a_n)$

$n$ - term #

$a_1$ — first term

$a_n = a_1 + (n-1)d$

need to know 4 things: $d, a_1, n, a_n$

**Example 2:** Find the sum of each arithmetic series.

a) $10 + 7 + 4 + ..., n = 5$, $d = 3$ $a_1 = 10$ $a_n = 10 + (5-1)\cdot -3 = -2$

$S_n = \left(\frac{5}{2}\right)(10 + -2) = 20$

b) $50 + 55 + 60 + ..., n = 7$, $d = 5$ $a_1 = 50$ $a_n = 50 + (7-1)5 = 80$

$S_n = \left(\frac{7}{2}\right)(50 + 80) = 455$

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**Example 3:** Find the sum of each geometric series.

$r$ - common ratio

a) $1 + 2 + 4 + ..., n = 5$

$r = 2 \quad a_1 = 1$

$S_n = \dfrac{1(1 - (2^5))}{(1-2)} = 31$

b) $80 - 40 + 20 - ..., n = 8$

$r = \dfrac{-40}{80} = -.5$

$r = -.5 \quad a_1 = 80$

$S_n = \dfrac{80(1 - (-.5)^8)}{(1 - -.5)} = 53.125$

c) $8 - \dfrac{8}{7} + \dfrac{8}{49} - ... + 8 \cdot \left(-\dfrac{1}{7}\right)^{2500}$

$a_1 = 8 \quad r = -\dfrac{1}{7} \quad n = 2500$

$S_n = \dfrac{8(1 - (-\frac{1}{7})^{2500})}{(1 - (-\frac{1}{7}))} = 7$

d) $1500 + (1500 \cdot 3)^1 + (1500 \cdot 3)^2 + ... + (1500 \cdot 3)^{11}$

$n = 12 \quad a_1 = 1500 \quad r = 3 \quad S_n = \dfrac{1500(1 - 3^{12})}{(1-3)} = 398580000$