

AFM - Review for Final: Fall 2015 ^{extra} problems

ADVANCED FUNCTIONS AND MODELING — RELEASED ITEMS



- 17 What is the explicit form of the equation $a_n = a_{n-1} + 2(n-1)$; $a_1 = 1$?

A $a_n = 2n - 1$
 B $a_n = n^2 - n + 1$
 C $a_n = n^2 - 2n + 2$
 D $a_n = 2n^2 - 2n - 1$

- 18 An investor bought 1,500 shares of a stock for \$6 a share. He estimates the probability that the stock will rise to a value of \$25 a share is 24%, and the probability it will fall to \$2 a share is 76%. What is the expected value of the investor's profit from buying the stock?

A \$13,560
 B \$9,120
 C \$6,720
 D \$2,280

	Gain +	Loss -
X	$\$25 \times 1500$ $= 37500$ $- 9000$ $= +28500$	$\$2 \times 1500$ $= 3000$ $- 9000$ $= -6000$
$P(x)$ (probability)	.24	.76

Expected value = $28500(.24) + (-6000)(.76) = 12280$

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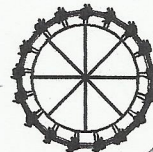
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- 19 A Ferris wheel is designed in such a way that the height (h), in feet, of the seat above the ground at any time, t , is modeled by the function

$$h(t) = 60 - 55 \sin\left(\frac{\pi}{10}t + \frac{\pi}{2}\right)$$

v shift = 60
 $amp = -55$



max height (amt) = $1amp + v$ shift

= $1(-55) + 60$

= $55 + 60$

= 115 ft

What is the **maximum** height a seat reaches?

A 55 feet
 B 60 feet
 C 110 feet
 D 115 feet

- 20 A teacher counts the final exam as 25% of each student's class grade. The remaining 75% is the mean of the student's test scores from the semester. Jaleesa's test scores for the semester are 86, 90, 92, and 80. What is the **minimum** score Jaleesa must get on the final exam to have a class grade of 85.0 or higher?

A 77
 B 79
 C 81
 D 83

Avg Test = $\frac{86 + 90 + 92 + 80}{4} = 87$

$.75(87) + .25x = 85$

$65.25 + .25x = 85$
 -65.25
 $-.25$

$.25x = 19.75$

$.25$ $.25$

$x = 79$

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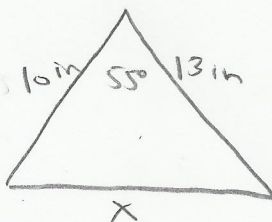
- 21 Two sides of a triangle measure 10 inches and 13 inches. The included angle between these sides is 55° . What is the **approximate** measure of the third side of the triangle?

A 10.9 inches
 B 11.2 inches
 C 13.9 inches
 D 16.2 inches

$x^2 = 10^2 + 13^2 - 2(10)(13)\cos 55$

$\sqrt{x^2} = \sqrt{119.8701265}$

$x = 10.9$



SAS \rightarrow Law of Cosines!

- 22 The third term of a geometric sequence is 96, and the fifth term is 1,536. What is the sum of the first ten terms of this sequence?

A 4,092
 B 1,572,864
 C 2,097,150
 D 33,554,400

$a_3 = 96$
 $a_5 = 1536$ gap!
 $S_{10} = ?$

① $1536 = a_1 r^4$
 $\div 96 = a_1 r^2$
 $16 = r^2$
 $r = 4$

② $1536 = a_1 (4)^4$
 $1536 = a_1 (256)$
 256 256
 $a_1 = 6$

③ $S_{10} = \frac{6(1-4^{10})}{(1-4)}$

= 2097150

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