Mat 011 Agenda Day 24       June 27, 2006
Return Test 4
Review for Final Exam

Homework: Study for Final Exam

Grades will be posted in BlackBoard and WebAdvisor Thursday
\[3 \left( \frac{72 + 72 + x}{3} \right) = 70\]
\[
\frac{92 + 92 + x}{3} = \frac{90}{1}
\]

\[
3(\frac{184 + x}{3}) = 3(\frac{90}{1})
\]

\[
184 + x = 270
\]

\[
-184 -184
\]

\[
x = 66
\]
\$11,000 \times 03.45\% \\
\text{\(FV = PV \times (1+i)^n\)} \\
= 11 \times (1.0345)^{340} \\
= \$1,121,401.12 \\
\text{\(FV = 11 \times (1.0345)^{300}\)} \\
= \$12,881,762.76
\[
\frac{0.345}{12} = 0.002875
\]

\[
FV = 11 \left(1.002875\right)^{3600}
\]

\[
= 11 \left(1.002875\right)^{3600}
\]

\[
= 3,387,594.76
\]
$y = x^2 - 2x - 8$ graphs as
Vertex: \( y = x^2 - 2x - 8 \)

1. \((1, -9)\)
2. \((0, -8)\)
3. \((4, 0)\)
4. \((-2, 0)\)

\[
\alpha = 1 \\
\nu = -2 \\
\sigma = -8 \\
\chi = -\frac{b}{2a} = \frac{2}{2(1)} = 1
\]
x-intercept:
\[ y = x^2 - 2x - 8 \]

1. (1, -9)
2. (0, -8)
3. (-4, 0)
4. (-2, 0)

0 = x^2 + 2x - 8
0 = (x + 4)(x - 2)
\[ x = -4, \quad x = 2 \]
y-intercept:

\[ y = x^2 - 2x - 8 \]

1. (1, -9)
2. (0, -8)
3. (-8, 0)
4. (-2, 0)

\[ y = 0 - 0 - 8 \]
\[ y = -8 \]
Expand \((x - 3)^2\)

1. \(x^2 - 9\)
2. \(x^2 + 9\)
3. \(x^2 - 6x - 9\)
4. \(x^2 - 6x + 9\)
Factor: $24x^2 - 18x$

1. $2x(12x - 9)$
2. $6(4x^2 - 3x)$
3. $6x(4x - 3)$ **(Corrected)**
4. $(6x - 1)(4x - 3)$
The graph of $y = -2x + 3$ is

1. 

2.

3.

4. 

$\left(0, 3\right)$

53%  27%  7%  13%
<table>
<thead>
<tr>
<th>#11</th>
<th>( \frac{25}{75} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast</td>
<td>Discount</td>
</tr>
<tr>
<td>10</td>
<td>.25 \times 10 = 2.50</td>
</tr>
<tr>
<td>17</td>
<td>.25 \times 17 = 4.25</td>
</tr>
</tbody>
</table>

Sale Price = .75 C

\[
11.95 = .75 C \\
- .75 \quad - .75 \\
\underline{15.94 = C}
\]
$$\frac{1x}{2x^3} \div \frac{2x^2}{5} \Rightarrow \frac{7x}{2x^3} \otimes \frac{5}{2x^2} = \frac{35}{4x^4}$$
\[3 \cdot \frac{5}{4x} + \frac{7}{12} \cdot x\]

\[\frac{15 + 7x}{12x}\]
#5

0\% \text{ change} \quad \frac{4.00 - 2.10}{2.10} = \frac{1.90}{2.1} \approx 0.905

1986 \quad 2.10 \text{ trillion}

1992 \quad 4.00 \text{ trillion}

\text{90.5\%}

Average rate of change

\text{Slope} \quad \frac{4.00 - 2.10}{1992 - 1986} = \frac{1.90}{4} = 0.475 \text{ trillion/year}
\#3

\[
\frac{2}{8}\left(\frac{x}{4}\right) + \frac{4}{1}(\frac{1}{2}) = \frac{8}{1}(\frac{7}{8})
\]

\[
2x + 4 = 7
\]

\[
-4 - 4
\]

\[
\frac{2x}{2} = \frac{3}{2}
\]

\[
x = \frac{3}{2}
\]

\[
x = 1.5
\]
\[
\frac{3}{6} \left( \frac{3}{1} \right) - \frac{2}{3} \left( \frac{x + 2}{3} \right) = \frac{x - 1}{6}
\]

\[
18 - 2(4x + 2) = x - 1
\]

\[
18 - 8x - 4 = x - 1
\]

\[
14 - 8x = x - 1
\]

\[
+ 8x + 8x
\]

\[
14 = 9x - 1
\]

\[
+ 1 + 1
\]

\[
15 = 9x
\]

\[
1.7 = \frac{5}{3} = x
\]
\[ 4a \quad 4x^{-3} = \frac{4}{x^3} \]

\[
\frac{(4x)^{-3}}{(4x)^3} = \frac{1}{(4x)^3} = \frac{1}{4^3 x^3} = \frac{1}{64x^3}
\]
\[ \frac{4x^3}{2x^2} = \frac{2}{x^2} \]
\[ x = \frac{5}{3} \approx 1.6666666 \]

\[ \text{mixed #} \]

\[ 1 \frac{2}{3} \]

\[ 1 \frac{2}{3} \]

\[ \frac{5}{3} \]
1.75

2nd F ↔ D

1 U 3/4

2nd A b/c ↔ d/c

\[ \frac{7}{4} \]
\[-2x \geq 18\]
\[\frac{-18}{-2} = \frac{18}{-2} = -9\]
\[x < -9\]

Interval notation: \((-\infty, -9)\)
\[-2x \leq 18\]
\[x \geq -9\]

Interval notation: \([-9, \infty)\)
\[-6 \leq 3x \leq 9\]

\[-2 < x \leq 3\]

\((-2, 3]\)
\[ C = 400 + 18.1 \] \[ 1000 < C < 5000 \]

\[
1000 < 400 + 18.15 < 5000 \\
- 400 - 400 \\
\]

\[
600 < 18.1 \cdot S < 4600 \\
\frac{600}{18.1} < \frac{S}{18.1} < \frac{4600}{18.1} \\
33.15 < S < 254.1 \\
\text{Valid} \quad \text{Valid} \]
<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>50,000</td>
<td>.07(50,000)+15,000</td>
<td>.15(50,000)</td>
</tr>
<tr>
<td>200,000</td>
<td>.07(200,000)+15,000</td>
<td>.15(200,000)</td>
</tr>
</tbody>
</table>

\[
W_A = W_B
\]

\[
.07S + 15,000 = .15S
\]

\[
-.07S
\]

\[
15,000 = .08S
\]

\[
.08 \cdot 187,500 = S
\]

Title: Jun 27-9:31 AM (27 of 67)
\[
\frac{72 + x}{2} = 80
\]

\[
72 + x = 160
\]

\[
-72
\]

\[
\frac{-72}{-72}
\]

\[
x = 88
\]
Ms. Piggie wants to enclose two adjacent chicken coops of equal size against the hen house wall. She has 66 feet of chicken-wire fencing and would like to make the chicken coup as large as possible. Find the formula for the area of the chicken coops.
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<tbody>
<tr>
<td>5</td>
<td></td>
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<tr>
<td>10</td>
<td></td>
<td></td>
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<tr>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X$</td>
<td></td>
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</tbody>
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Ms. Piggie wants to enclose two adjacent chicken coops of equal size against the hen house wall. She has 66 feet of chicken-wire fencing and would like to make the chicken coup as large as possible. Find the formula for the area of the chicken coops.

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</thead>
<tbody>
<tr>
<td>5</td>
<td>66-3(5)=56</td>
<td>5(51)=251</td>
</tr>
<tr>
<td>10</td>
<td>66-3(10)=36</td>
<td>10(36)=360</td>
</tr>
<tr>
<td>15</td>
<td>66-3(15)=21</td>
<td>15(21)=315</td>
</tr>
<tr>
<td>X</td>
<td>66-3(X)</td>
<td>X(66-3X)=66X-3X²</td>
</tr>
</tbody>
</table>
Graph: \[ A = -3X^2 + 66X \]

Vertex:

\[ X = \frac{-b}{2a} \quad X = \frac{-66}{2(-3)} = \frac{-66}{-6} = 11 \]

\[ A = -3(11)^2 + 66(11) = 363 \]

Vertex: (11, 363)

x=11 feet, A = 363 sq. feet
Graph: $A = -3X^2 + 66X$

x-Intercepts: when $A = 0$, what is $x$?
Graph: \[ A = -3X^2 + 66X \]

\[ \text{x-Intercepts: when } A = 0, \text{ what is } x? \]

\[ A = -3X^2 + 66X \]

\[ 0 = -3X^2 + 66X \]

\[ 0 = -3X(X - 22) \]

\[ 0 = -3X \quad \text{or} \quad 0 = (X - 22) \]

\[ 0 = X \quad \text{or} \quad X = 22 \]
Graph: \[ A = -3X^2 + 66X \]

A-Intercept: when \( x = 0 \), what is \( A \)?

\[ A = -3X^2 + 66X \]
Graph: \[ A = -3X^2 + 66X \]

1. Because \( a = -3 \), parabola opens down
2. Vertex: \((11, 363)\)
3. x-Intercepts: \((0, 0)\) and \((22, 0)\)
4. A-Intercept: \((0, 0)\)
Graph: \[ A = -3X^2 + 66X \]
Find the dimensions of the coop if the area can only be 360 sq feet.

When $A = 360$, what is $x$?

$A = -3X^2 + 66X$

$360 = -3X^2 + 66X$

Subtract 360 from both sides

$0 = -3X^2 + 66X - 360$

$0 = -3(X^2 - 22X + 120)$

$0 = -3(X - 10)(X - 12)$

$0 = (X - 10)$ or $0 = (X - 12)$
Find the dimensions of the coop if the area can only be 360 sq feet.

When $A = 360$, what is $x$?

$$A = -3x^2 + 66x$$

$$360 = -3x^2 + 66x$$

Subtract 360 from both sides

$$0 = -3x^2 + 66x - 360$$

$$0 = -3(x^2 - 22x + 120)$$

$$0 = -3(x - 10)(x - 12)$$

$$0 = (x - 10) \quad \text{or} \quad 0 = (x - 12)$$

$$x = 10 \quad \text{or} \quad x = 12$$
Graph: \[ A = -3X^2 + 66X \]
Graph: \[ A = -3X^2 + 66X \]

Area (sq. feet):

- (0,0)
- (11,363)
- (22,0)

Width (feet):

3  6  9  12  15  18  21

Lecture 32
Graph: \[ A = -3X^2 + 66X \]
Graph: \[ A = -3X^2 + 66X \]
Lighten Up Company makes light bulbs. The cost of making $x$ thousand light bulbs per week is $C = 0.5x^2 - 14x + 120$. The revenue from selling $x$ thousand light bulbs per week is $R = 12x - 0.5x^2$.

Find the equation for Profit.
A farmer wants to enclose adjacent rectangular fields with 1000 feet of barbed wire fencing as indicated below. Find the equation for the area of the fields.
State the quadratic formula.
State the formula for the x coordinate of the vertex.
Herb's Company need to make a profit of $30. Graph and find where the lines intersect.
Graph the Profit Equation

\[ P = -2x^2 + 28x - 50 \]

When \( P = 30 \), what is \( x \)?

\[ P = -2x^2 + 28x - 50 \]
Simplify:

\[ 5(2x^2 - x + 1) - 3(6x^2 - 7x + 2) \]
Multiply:

\[(2x-1)(x+5)\]
Multiply: \((x-3)^2\)
Factor: $9x^2 + 6x$
Factor: $x^2 - 2x - 15$
Solve: $x^2 + 5x + 6 = 0$
3. A farmer wants to enclose a rectangular chicken coop

![Diagram of rectangular chicken coop with barn]

with 600 feet of chicken wire. The farmer will use the barn as one of the sides of the chicken coop.

Find the equation for the area of the chicken coops. Start by making a table.

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<td>75</td>
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<tr>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Brighten Up Company makes overhead projectors. The cost of making $x$ projectors per month is

$$C = .3x^2 - 65x + 800$$

and the revenue from selling $x$ projectors per month is

$$R = -.7x^2 + 25x.$$ 

$C$ and $R$ are in hundreds of dollars.

Vertex:

Meaning:

$X$ intercepts:

Meaning:

$P$ intercept:

Meaning:
A cannon ball is shot straight up into the air. The height of the cannon ball is given by the equation
\[ h = -16t^2 + 480t \] (\( h \) is in feet and \( t \) is in seconds)

The graph of the equation is given below.

a. When will the height of the cannon ball be 2000 feet? (Hint: you must use algebra to find the points of intersection.)

b. Graph the line \( h = 2000 \) on the graph above and label the points of intersection.
6. Simplify: \(4(3x^2 - 7x + 5) - 3(5x^2 + x - 6)\)
7. Multiply.
   a. \((2x - 5)(4x - 1)\)
\((x + 5)^2\)
8. Factor.
   a. $16x^2 - 2x$
$x^2 - x - 6$
$x^2 - 25$
Solve for $x$:

$$x^2 + 10x - 11 = 0$$