

Chapter 13

NO CALCULATOR!

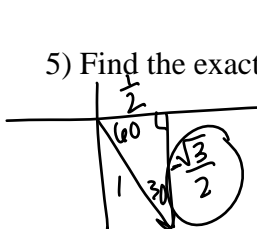
1) Change -75° to radians

$$-75 \cdot \frac{\pi}{180} = \boxed{-\frac{5\pi}{12}}$$

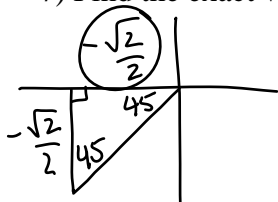
3) Change $\frac{5}{3}\pi$ radians to degrees

$$\frac{5\pi}{3} \cdot \frac{180}{\pi} = \frac{900}{3} = \boxed{300^\circ}$$

5) Find the exact value of $\sin\left(-\frac{\pi}{3}\right) = \boxed{-\frac{\sqrt{3}}{2}}$

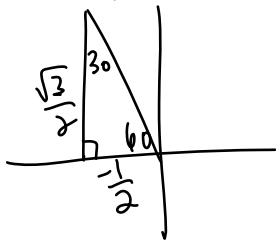


7) Find the exact value of $\cos(225^\circ) = \boxed{-\frac{\sqrt{2}}{2}}$



9) Find the exact value of $\tan\left(\frac{2}{3}\pi\right)$

$$\frac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = \boxed{-\sqrt{3}}$$



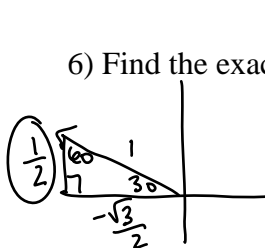
2) Change -315° to radians

$$-315 \cdot \frac{\pi}{180} = \boxed{-\frac{7\pi}{4}}$$

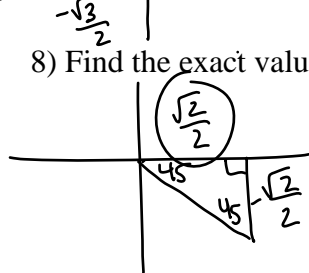
4) Change $\frac{5}{4}\pi$ radians to degrees

$$\frac{5\pi}{4} \cdot \frac{180}{\pi} = \frac{900}{4} = \boxed{225^\circ}$$

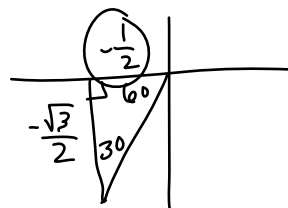
6) Find the exact value of $\sin(510) = \boxed{\frac{1}{2}}$



8) Find the exact value of $\cos\left(-\frac{\pi}{4}\right) = \boxed{\frac{\sqrt{2}}{2}}$



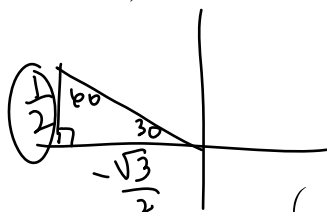
10) Find the exact value of $\sec(240^\circ) = \frac{1}{\cos(240^\circ)} = \frac{1}{-\frac{1}{2}}$



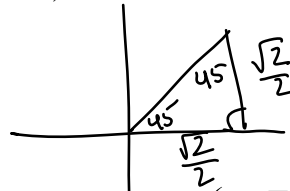
$$\sec 240 = \boxed{-2}$$

11) Find the exact value of $\csc(150^\circ) = \frac{1}{\sin(150^\circ)} = \frac{1}{\frac{1}{2}}$

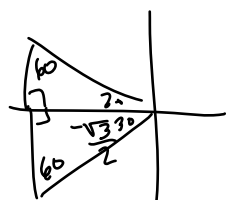
$$\csc 150 = \boxed{2}$$



12) Find the exact value of $\cot\left(\frac{9\pi}{4}\right) = \boxed{1}$



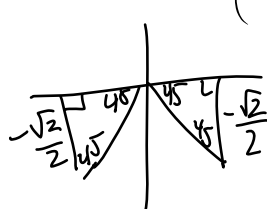
13) Find $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ in degrees. \leftarrow Q2, Q3



$$\boxed{150^\circ}$$

$$\boxed{210^\circ}$$

14) Find $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$ in degrees. \leftarrow Q3, Q4



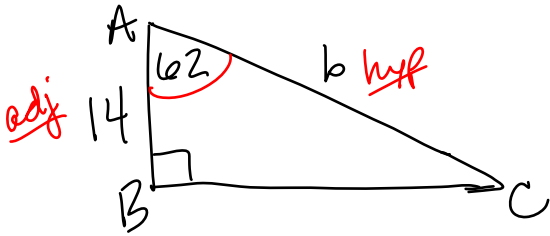
$$\boxed{225^\circ}$$

$$\boxed{315^\circ}$$

CALCULATOR!

Find the value of each, rounding to four decimal places.

15) In $\triangle ABC$, $\angle B$ is a right angle, $\angle A = 62^\circ$, and $c = 14$. What is the length of side b ?



$$\cos 62 = \frac{14}{b}$$

$$b \cdot \cos 62 = 14$$

$$b = 29.82$$

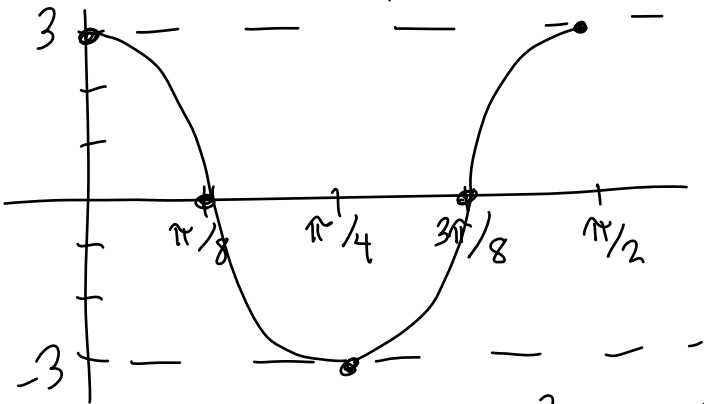
Chapter 14

NO CALCULATOR!

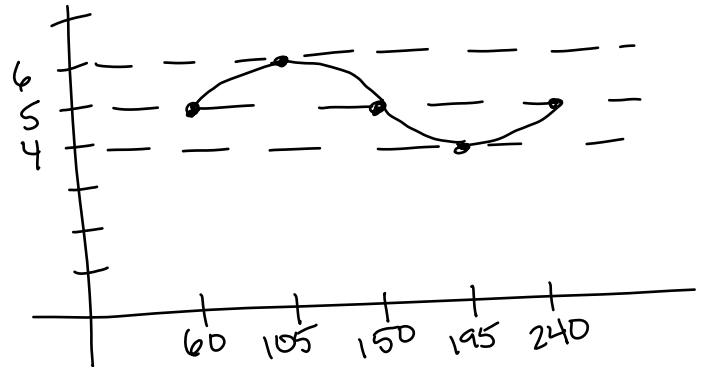
1) State the following for each function, if they exist, and then graph them:
 • Amplitude, Period, Vertical Shift and Phase Shift (horizontal)

$$y = A \sin/\cos(B(x-D)) + C$$

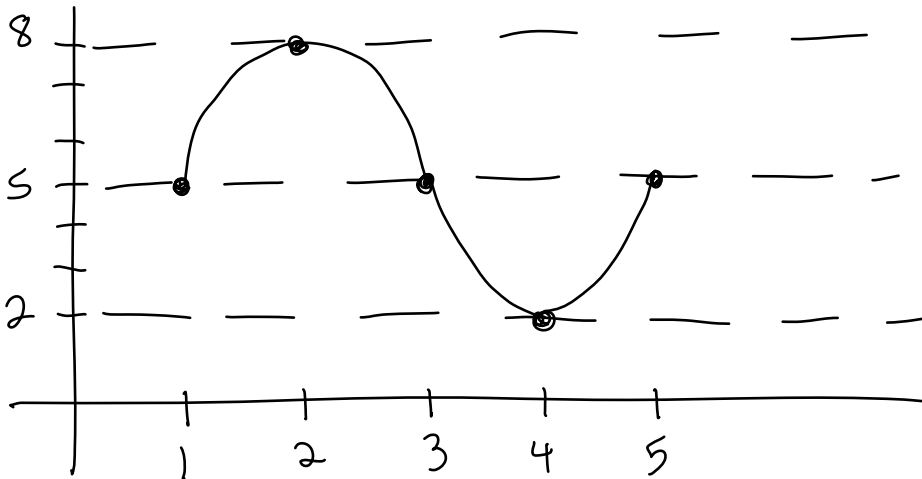
a. $y = 3\cos 4x$
 Amp = 3
 Period = $\frac{1}{4} \cdot 2\pi = \frac{\pi}{2}$
 Vert shift = 0
 Phase shift = 0



b. $y = 5 + \sin 2(\theta - 60^\circ)$
 Amp = 1
 Period = $\frac{1}{2} \cdot 360 = 180$
 Phase shift = right 60
 Vert shift = 5

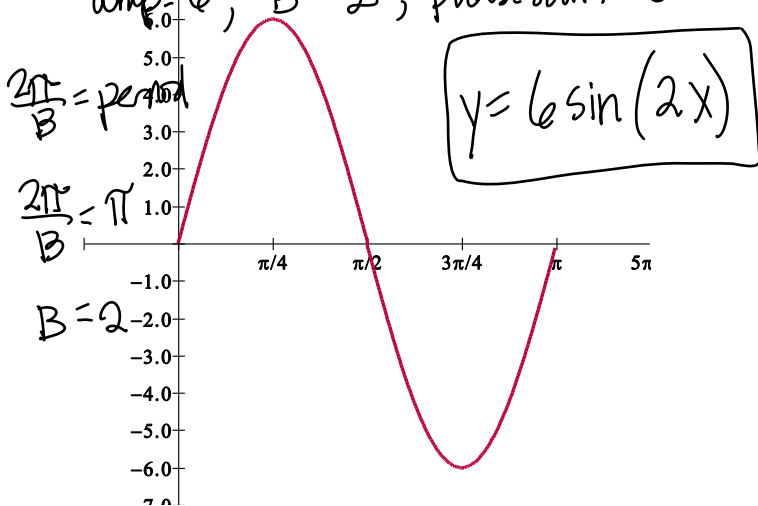


c. $y = 5 + 3\sin \frac{\pi}{2}(x-1)$
 Period = $\frac{2}{\pi} \cdot 2\pi = 4$
 Amp = 3
 Vert shift = 5
 Phase shift = right 1

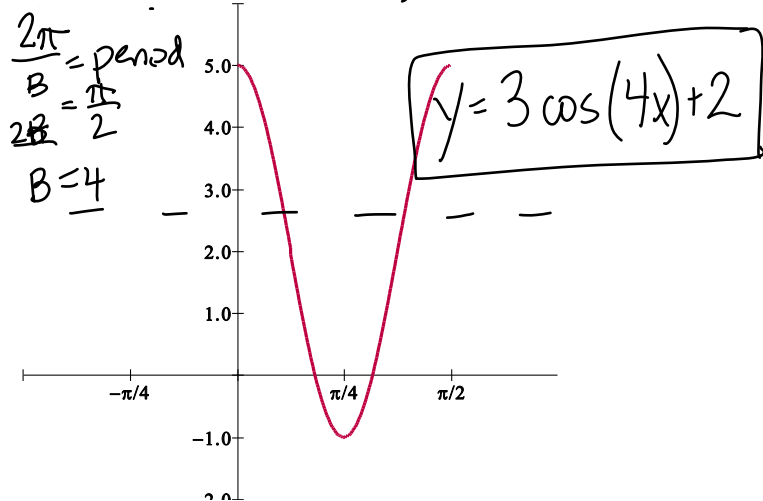


vert shift = 0

2) Write an equation for the following graphs:
amp = 6, B = 2, phase shift = 0



vert shift = 2
amp = 3, B = 4, phase shift = 0

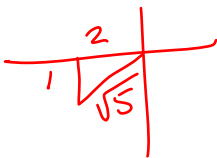


3) Find the exact value of $\cos \theta$ if $\sin \theta = \frac{5}{13}$ and θ is in Quadrant II.



$\cos \theta = \boxed{-\frac{12}{13}}$

4) Find the exact value of $\sec \theta$ if $\tan \theta = \frac{1}{2}$ and θ is in Quadrant III.

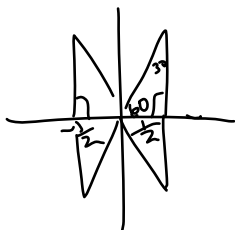


$\cos \theta = -\frac{2}{\sqrt{5}}$

$\sec \theta = \boxed{-\frac{\sqrt{5}}{2}}$

5) Solve for θ : $4\cos^2 \theta = 1$ for $0 \leq \theta < 360^\circ$

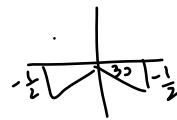
$\cos \theta = \pm \frac{1}{2}$



$60^\circ, 120^\circ, 240^\circ, 300^\circ$

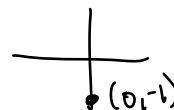
6) Solve for θ : $2\sin^2 \theta + 3\sin \theta + 1 = 0$ for $0 \leq \theta < 360^\circ$

$(2\sin \theta + 1)(\sin \theta + 1) = 0$



$\sin \theta = -\frac{1}{2}$ $\sin \theta = -1$

$210^\circ, 330^\circ$ 270°



Chapter 12

CALCULATOR!

Answer the following questions about counting and probability.

- 1) How many ways can you form an outfit of shoes, pants, and a shirt if there are 10 pairs of shoes to choose from, 5 pairs of pants, and 5 shirts?

$$10 \cdot 5 \cdot 5 = \boxed{250 \text{ outfits}}$$

- 2) How many ways can you arrange 8 books on a shelf?

$$8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = \boxed{40,320}$$

- 3) A die is rolled twice. What is the probability of:

a) Getting the same number both times $\frac{6}{6} \cdot \frac{1}{6} = \boxed{\frac{1}{6}}$

b) Getting a 5 both times $\frac{1}{6} \cdot \frac{1}{6} = \boxed{\frac{1}{36}}$

c) Getting a number less than 2 both times $\frac{1}{6} \cdot \frac{1}{6} = \boxed{\frac{1}{36}}$

- 4) A coin is tossed 3 times. Find the probability of getting tails all three times.

$$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \boxed{\frac{1}{8}}$$

- 5) In my wallet there are 4 ten dollar bills and 6 five dollar bills. If three bills are drawn at random, find the probability of the following: **no replacement*

5510 1055
5105

- a) P(3 tens)

$$\frac{4}{10} \cdot \frac{3}{9} \cdot \frac{2}{8} = \frac{24}{720}$$

$$\boxed{\frac{1}{30}}$$

- b) P(2 fives and then a ten)

$$\frac{6}{10} \cdot \frac{5}{9} \cdot \frac{4}{8} = \frac{120}{720}$$

$$\boxed{\frac{1}{6}}$$

- c) P(2 fives and then a ten)
in any order

$$\frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{3}{6}$$

$$= \boxed{\frac{1}{2}}$$

Chapter 9

NO CALCULATOR!

Simplify.

1. Sketch a graph of the function. State its Domain and Range.

X	Y
-2	18
-1	6
0	2
1	2/3
2	2/9

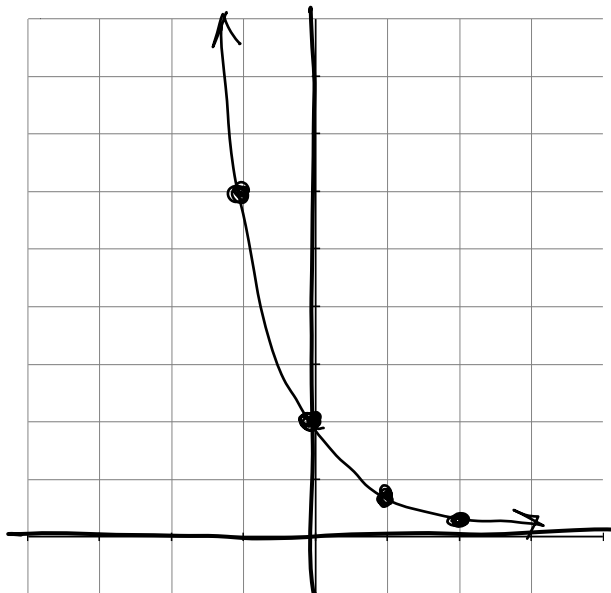
$$y = 2\left(\frac{1}{3}\right)^x$$

Domain:

$$\mathbb{R}$$

Range:

$$y > 0$$



2. Write the exponential function that passes through (0,4) and (2,16) (CALCULATOR OK!)

Stat: Edit

L1	L2
0	4
2	16

Stat: Calc
0: Exp Reg

$$y = 4(2)^x$$

Solve each equation.

3. $3^x = 27$

$$x = 3$$

4. $2^{3y} = 16^{y-1}$

$$2^{3y} = 2^{4(y-1)}$$

$$3y = 4y - 4$$

$$-1y = -4$$

$$y = 4$$

Write each equation in logarithmic form.

5. $4^x = 32$

$$\log_4 32 = x$$

6. $x^2 = 36$

$$\log_x 36 = 2$$

Write each equation in exponential form.

7. $\log_{10} 100 = 2$

$$10^2 = 100$$

8. $\log_3 27 = 3$

$$3^3 = 27$$

Solve each equation.

$$9. \log_4 \frac{1}{64} = x$$

$$4^x = \frac{1}{64}$$

$$4^x = 4^{-3}$$

$$x = -3$$

$$10. \log_3 \frac{1}{9} = x$$

$$3^x = \frac{1}{9}$$

$$3^x = 3^{-2}$$

$$x = -2$$

$$11. \log_x 10 = \frac{1}{4}$$

$$\left(x^{\frac{1}{4}}\right)^4 = (10)^4$$

$$x = 10,000$$

$$12. \log_x 1 = 4$$

$$x^4 = 1$$

$$x = 1$$

$$13. \log_5 x - 2\log_5 3 = \log_5 5$$

$$\log_5 \frac{x}{9} = \log_5 5$$

$$\frac{x}{9} = 5$$

$$x = 45$$

$$14. \log_5 x + \log_5 3 = \log_5 15$$

$$\log_5 3x = \log_5 15$$

$$3x = 15$$

$$x = 5$$

$$15. \log_4 (4x-6) = \log_4 (2x-1)$$

$$4x-6 = 2x-1$$

$$2x = 5$$

$$x = \frac{5}{2}$$

$$16. \log_2 (4x-6) = \log_2 (x+2)$$

$$4x-6 = x+2$$

$$3x = 8$$

$$x = \frac{8}{3}$$

$$17. \log_3 x - \log_3 3 = \log_3 30$$

$$\log_3 \frac{x}{3} = \log_3 30$$

$$\frac{x}{3} = 30$$

$$x = 90$$

$$18. \log_5 x + 2\log_5 3 = \log_5 5$$

$$\log_5 9x = \log_5 5$$

$$9x = 5$$

$$x = \frac{5}{9}$$

Use $\log_2 3 = a$ and $\log_2 5 = b$ to evaluate the expression.

$$19. \log_2 50$$

$$\log_2 5^2 \cdot 2$$

$$2 \cdot \log_2 5 + \log_2 2$$

$$2b + 1$$

$$20. \log_2 \frac{18}{5}$$

$$\log_2 3^2 - \log_2 5$$

$$2 \cdot \log_2 3 - \log_2 5$$

$$2a - b$$

$$21. \log_2 30$$

$$\log_2 3 + \log_2 5 + \log_2 2$$

$$a + b + 1$$

$$22. \log_2 \frac{25}{2}$$

$$\log_2 5^2 - \log_2 2$$

$$2 \cdot \log_2 5 - \log_2 2$$

$$2a - 1$$

CALCULATOR!

Evaluate each log. (round answers to four decimal places)

1) $\log 124$

2.0934

2) $\log \frac{11}{30}$

$-.4357$

3) $\log \sqrt{28}$

$.7236$

4) $\log 1$

0

Change each log expression to common logs. (round answers to four decimal places)

5) $\log_5 3 \frac{\log 3}{\log 5}$

$.6826$

6) $\log_3 10 \frac{\log 10}{\log 3}$

2.0959

7) $\log_5 \frac{25}{4} \frac{\log 6.25}{\log 5}$

1.1386

8) $\log_{\frac{1}{4}} 9 \frac{\log 9}{\log .25}$

-1.5850

Solve each equation below. (round final answers to four decimal places)

9) $5^x = 19$

$x \cdot \log 5 = \log 19$

$x = 1.8295$

10) $12^{2x-1} = 23$

$(2x-1) \cdot \log 12 = \log 23$

$2x-1 = 1.2618$

$2x = 2.2618$

$x = 1.1309$

11) $3^{x^2} = 7$

$(x^2) \cdot \log 3 = \log 7$

$x^2 = 1.7712$

$x = \pm 1.3309$

Use the equation: $A = P(1 \pm \frac{r}{n})^{i \cdot n}$ to answer #12 and 13 (round final answers to two decimal places)

12) Tessa is saving for a new TV and stereo system. She just received \$2000 for graduation and plans to invest it in an account that earns 4.35% interest compounded monthly. How long will she need to invest her money in order to have the \$3000 she needs to buy the system?

$3000 = 2000 (1 + \frac{.0435}{12})^{12t}$

$1.5 = (1.003625)^{12t}$

$\log 1.5 = 12t \cdot \log 1.003625$

$112.0551 = 12t$

$t = 9.34 \text{ years}$

13) Phil wants to double his \$17000 investment in 8 years. What interest rate would he need if the interest is compounded annually?

$34000 = 17000 (1 + \frac{r}{1})^{1 \cdot 8}$

$(2)^{\frac{1}{8}} = ((1+r)^8)^{\frac{1}{8}}$

$1.0905 = 1 + r$

$r = .0905$

Chapter 8: RATIONAL EXPRESSIONS AND EQUATIONS:

1. Simplify. Under what conditions is the expression undefined?

$$\frac{3x+6}{x^2+3x+2}$$

$$(x+2)(x+1)$$

undefined if $x = -2, -1$

2. Simplify each expression.

a) $\frac{\cancel{8x^2} \cdot \cancel{9y^2}}{\cancel{12x^2} \cdot \cancel{10x^2}} \cdot \frac{3}{4y^2 \cdot 2x^3}$

$$\frac{3}{8x^3y^2}$$

b) $\frac{x-3}{x+1} \div \frac{x^2+2x-15}{4x+4}$

$$\frac{\cancel{x-3}}{\cancel{x+1}} \cdot \frac{4(\cancel{x+1})}{(x+5)(x-3)}$$

$$\frac{4}{x+5}$$

c) $\frac{7a^2b}{7a^2b} \cdot \frac{5a^2}{6b} + \frac{9 \cdot 3}{14a^2b^2 \cdot 3}$

$$\frac{35a^4b}{42a^2b^2} + \frac{27}{42a^2b^2}$$

$$\frac{35a^4b + 27}{42a^2b^2}$$

3. Solve for x.

a) $\frac{(x-5)3x-1}{(x-5)x+5} + \frac{32}{x^2-25} = \frac{3x+1(x+5)}{x-5(x+5)}$

$$(x-5)(3x-1) + 32 = (3x+1)(x+5)$$

$$3x^2 - 16x + 5 + 32 = 3x^2 + 16x + 5$$

$$-32x = -32$$

$$x = 1$$

b) $\frac{(x-2)4x(x-1)}{(x-2)x-1} - \frac{5x}{x-2} = \frac{2}{x^2-3x+2}$

$$4x(x-2) - 5x(x-1) = 2$$

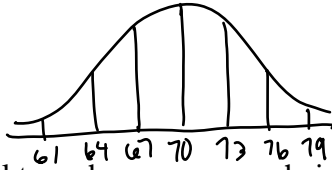
$$4x^2 - 8x - 5x^2 + 5x = 2$$

$$-1x^2 - 3x - 2 = 0$$

$$-1(x+3x+2) = 0$$

$$-1(x+2)(x+1) = 0$$

$$x = -2, -1$$

STATISTICS:

1. The Hinsdale Central basketball team has an average height of 70 inches with a standard deviation of 3 inches.

a.) What percentage of basketball players has a height between 67 and 79 inches?

$$34 + 34 + 13.5 + 2.35 = \boxed{83.85\%}$$

b.) What percentage of basketball players has a height above 74 inches?

$$z = \frac{74 - 70}{3} = 1.33 \quad 1 - .9082 = .0918 \quad \boxed{9.18\%}$$

2. Find the standard deviation of the following test scores: 85, 89, 80, 88, 90.

$$\mu = 86.4 \quad 1.4^2 + 2.6^2 + 6.4^2 + 1.6^2 + 3.6^2 = 65.2$$

$$\frac{65.2}{5} = 13.04 \quad \sqrt{13.04} = \boxed{3.61}$$

3. The following is an example of which sampling method?

a.) All of 10th hour Algebra 2 students are lined up and every 5th student is selected.

systematic

b.) The hospital is divided into occupation groups (doctor, nurse, therapist, etc), and then a random sample is taken from each.

stratified random