

Today's Objectives: Review for the Final

$$2) (7r^4 + 6r^3 + 8r^2) + (4r^4 - 7r^3 + 3r^2) - (6r^4 + 5r^2 + 3r^3)$$

$$-2|x+1|+3 = -5 \quad -2|x+1| = -8$$

$$|x+1| = 4$$

$$|4| = 4$$

$$|-4| = 4$$

$$x+1 = 4$$

$$x+1 = -4$$

$$x = 3, -5$$

$$5) (2n^2 - 4n - 6)(n^2 - 5n - 4)$$

$$2n^4 - 10n^3 - 8n^2$$

$$- 4n^3 + 20n^2 + 16n$$

$$- 6n^2 + 30n + 24$$

$$2n^4 - 14n^3 + 6n^2 + 46n + 24$$

7) $(a^3 + a^2 - 58a + 4) \div (a - 7)$

$$\boxed{a^2 + 8a - 2 - \frac{10}{a-7}}$$

$$\begin{array}{r|rrrr} 7 & 1 & 1 & -58 & 4 \\ & \downarrow & 7 & 56 & -14 \\ \hline & 1 & 8 & -2 & -10 \end{array}$$

9) $\frac{1}{n-6} + \frac{1}{n^2-n-30} = \frac{8}{n^2-n-30}$

~~$(n-6)(n+5)$~~ ~~$(n-6)(n+5)$~~ ~~$(n-6)(n+5)$~~

~~$(n+5)(n-6)$~~ ~~$(n+5)(n-6)$~~

$$\frac{-6}{-1} \times \frac{30}{5}$$

1. Factor
2. Cancel Fractions
3. Solve for X

$$1(n+5) + 1 = 8$$

$$n + 5 + 1 = 8 - 6$$

$$\boxed{n = 2}$$

$$11) 12 = \cancel{2} + \sqrt{\frac{x}{6}}$$

$$10^2 = \sqrt{\frac{x}{6}}^2 \quad 6 \cdot 100 = \frac{x}{6} \cdot \cancel{6}$$

$$x = 600$$

Solve each equation.

$$13) \log_4 4x + \log_4 2 = 1$$

$$\cancel{4} \log_4 (8x) = 1$$

$$\cancel{8}x = \frac{4}{\cancel{8}}$$

$$\log_b x + \log_b y - \log_b z = \log_b \left(\frac{xy}{z} \right)$$

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

Solve each equation.

$$15) 5^{x-8} - 3 = 66 + 3 \quad \log_5(5^{x-8}) = (69)$$

$$x = \log_5(69) + 8 \quad x - 8 = \log_5(69) + 8$$

$$x = 10.6308$$

switch x & y , solve for y

Find the inverse of each function.

$$17) f(x) = \frac{2}{x} - 1$$

$$x = \frac{2}{y} - 1 \quad \text{circled } (x+1) \quad \frac{2}{y} \cdot y$$

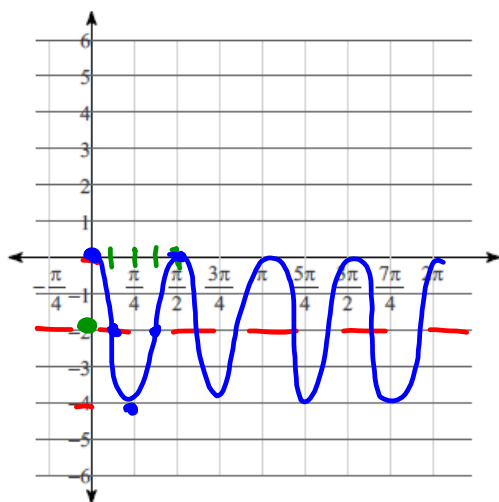
$$y = \frac{2}{x+1}$$

$$f^{-1}(x) = \frac{2}{x+1}$$

$$\frac{y(x+1)}{x+1} = \frac{2}{x+1}$$

$a \cos(bx) + k$

$$22) y = 2 \cos 4\theta - 2$$



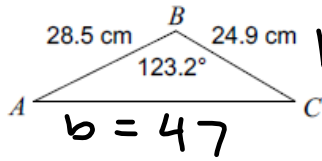
$$a = \text{amplitude} = 2$$

$$k = \text{midline} = -2$$

$$\text{period} = \frac{2\pi}{b} = \frac{2\pi}{4} = \frac{\pi}{2}$$

Find each measurement indicated. Round your answers to the nearest tenth.

23) Find AC



$$b^2 = a^2 + c^2 - 2ac \cdot \cos(B)$$

$$b^2 = (24.9)^2 + (28.5)^2 - 2(24.9)(28.5) \cos(123.2)$$

$$\sqrt{b^2} = \sqrt{2209.3}$$

Solve each equation for $0 \leq \theta < 2\pi$

25) $-4 - 3\sin \theta = -4.57$

$$-3\sin \theta = -0.57$$

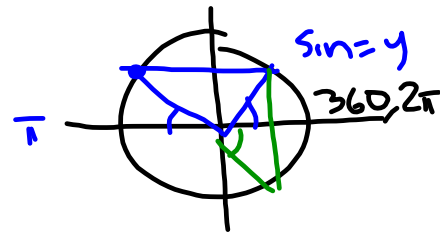
$$\sin^{-1}(\sin \theta) = \sin^{-1}(.19)$$

$$\theta = .19 \quad \theta = 2.95$$

$$2^{\text{nd}} = \pi - 1^{\text{st}}$$

cos:

$$2^{\text{nd}} = 2\pi - 1^{\text{st}}$$



31) What is the average rate of change on the function $f(x) = x^3 - 2x^2$ on the interval $[-1, 5]$

x_1, x_2

$$y_2 = (5)^3 - 2(5)^2 = 75$$

$$y_1 = (-1)^3 - 2(-1)^2 = -3$$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{\Delta y}{\Delta x}$$

$$\frac{75 - (-3)}{5 - (-1)} = \frac{78}{6}$$

$$= \textcircled{13}$$

33) Solve the system of equations

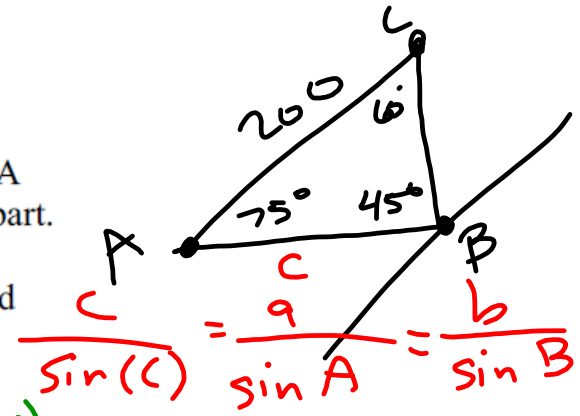
$$y = x^2 - 5x + 6$$

$$y = \log_4 x - 5$$

no solution

$$\begin{aligned} &(-2.6, -2.9) \\ &(1.1, -1.87) \end{aligned}$$

- 35) A surveyor needs to determine the distance between two points that lie on opposite banks of a river. Two points, A and C, along one bank are 200 yards apart. The point B is on the opposite bank. Angle A is 75° and angle C is 60° . Find the distance between A and B to the nearest tenth of a yard.

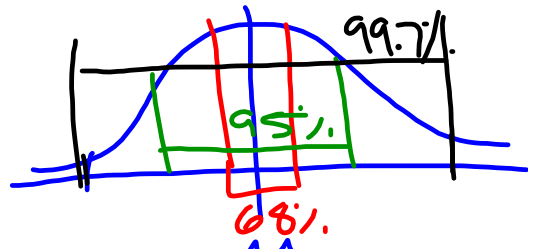


$$\frac{c \sin(60)}{\sin(60)} = \frac{200 \sin(60)}{\sin(45)}$$

$$\frac{c}{\sin(C)} = \frac{a}{\sin A} = \frac{b}{\sin B}$$

$$c = 245.0 \text{ yds}$$

- 37) ACT test scores are approximately normally distributed. One year the scores had a mean of 21 and a standard deviation of 5.2.



- a. What is the interval that contains 95% of scores?

$$21 \pm 5.2 = 15.8 - 26.2$$

- b. What percentage of ACT scores is between 28 and 36?

2nd VARS (DISTR) 2: normalcdf

$$\text{cdf}(28, 36, 21, 5.2) = .087$$

8.7%

- 40) A study of 200 Utah families found that the average number children is 2.1, with a standard deviation of 1.1.

a) Find the margin of error for a 95% confidence level $m.e. = \frac{2.5}{\sqrt{n}} = \frac{2 \cdot (1.1)}{\sqrt{200}} = .156$

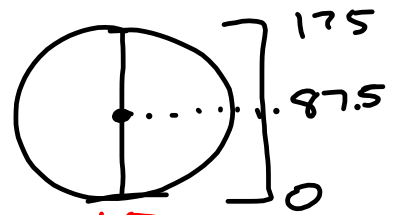
b) Find the 95% confidence interval for the population proportion $\bar{x} \pm m.e. \quad 2.1 \pm .16 \quad 1.94 - 2.26$

c) Interpret the confidence interval's meaning in the context of this problem

We're 95% confident that the population avg # of kids is between 1.94 - 2.26

- 41) The Great Wheel in Seattle is the largest observation wheel on the west coast, standing 175 feet tall. Suppose you enter the bottom of the wheel at ground level and the wheel rotates once every 16 minutes. What will your height be after riding on the wheel for 7 minutes?

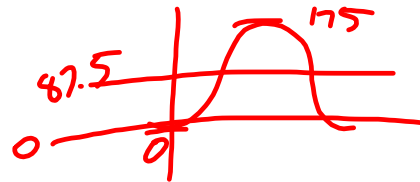
$$a \cos(bx) + k$$



$$a = 87.5$$

$$k = 87.5$$

$$b = \frac{2\pi}{\text{per}} = \frac{2\pi}{16} = \frac{\pi}{8}$$



$$h(7) = 168.3 \text{ ft}$$

$$h(x) = -87.5 \cos\left(\frac{\pi}{8}x\right) + 87.5$$

$$h(7) = -87.5 \cos\left(\frac{\pi}{8} \times 7\right) + 87.5$$