Solutions to Accuplacer Practice Test

1.) $x+5y=25$

let $y=1$, $x=20$

let $y=2$, $x=15$

let $y=3$, $x=10$

let $y=4$, $x=5$

let $y=5$, $x=0$

* 5 solutions

2.) $\sqrt{|x|}=3$

$(\sqrt{|x|})^2 = 3^2$

$|x| = 9$

$x = \pm 9$

3.) $x+2y=3$

$2x+3y=4$

$-2(x+2y=3)$

$-2x-4y=-6$

$2x+3y=4$

$-y=-2$

$\frac{\cancel{-y}}{-1} = \frac{-2}{-1}$

$\underline{y=2}$

$x+2(2)=3$

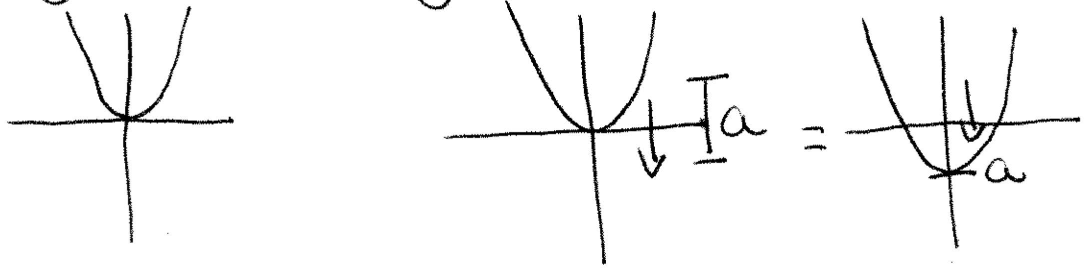
$x+4=3$

$-4 \quad -4$

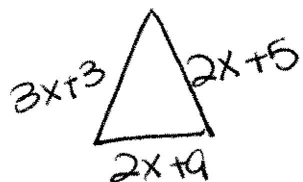
$\underline{x=-1}$

$(x,y) \rightarrow \boxed{(-1,2)}$

4.) $y = x^2$ $\qquad$ $y = x^2 - a \leftarrow$ move down "a" units



5.) Perimeter = add up the length of all the sides



$$7x$$

$$P = (3x+3) + (2x+9) + (2x+5)$$

$$17$$

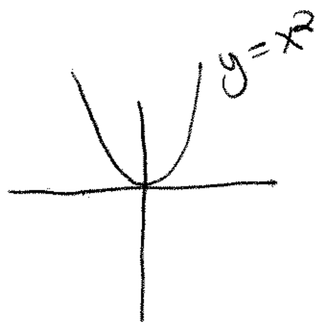
$$\boxed{P = 7x + 17}$$

6.) $\sin^2 x + \cos^2 x = 1$

So $k = 1$

$y = (1)x^2$

$y = x^2$



7.) $\cos 180° = -1$

$$\boxed{\sin 180° = 0}$$

8.) $x^3 - 2x^2 + 3x + k \quad x = -2$

$(-2)^3 - 2(-2)^2 + 3(-2) + k = 0$

$-8 - 8 - 6 + k = 0$

$-22 + k = 0$

$+22 \qquad +22$

$\boxed{k = 22}$

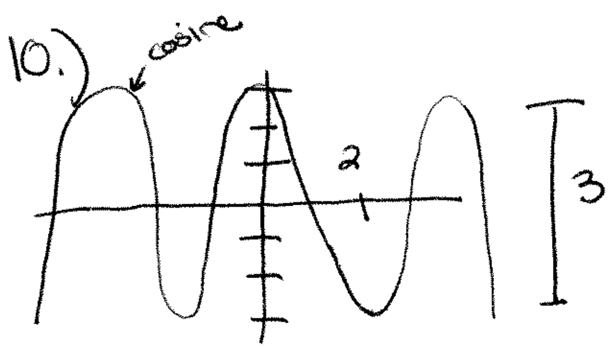
9.) $\cos\left(\frac{x}{4}\right)$ has the largest period

$\text{Period} = \dfrac{2\pi}{(\text{whats in the parenthesis!})}$

↑ leave out x

$= \dfrac{2\pi}{\left(\frac{1}{4}\right)} = \boxed{8\pi}$

10.)



amplitude

$3\cos(2x)$

11.) x=adults

y=children

$$x+y=650$$
$$-x \qquad -x$$
$$y=650-x$$

$$15x+11y=8790$$

$$15x+11(650-x)=8790$$

$$15x+7150-11x=8790$$
$$-7150 \qquad -7150$$

$$4x=1640$$

$$\frac{4x}{4}=\frac{1640}{4}$$

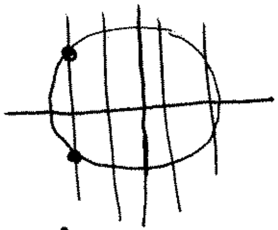
$$\boxed{x=410}$$

$$15(410)+11y=8790$$
$$6150+11y=8790$$
$$-6150 \qquad -6150$$

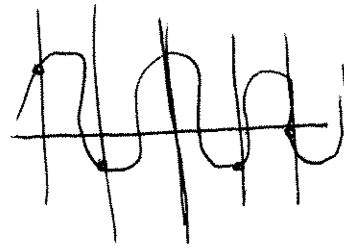
$$\frac{11y}{11}=\frac{2640}{11}$$

$$\boxed{y=240}$$

12.) If it is a function it passes the vertical line test!



This single vertical line hits two points on the circle, it should only hit one to pass



Each vertical line hits the graph once, it is a function!

13.) $-|4-10|+|-3|-|5|$

$-|-6|+|-3|-|5|$

$-(6)+(3)-(5)$

$\boxed{=-8}$

14.) $\dfrac{6p-2q^2}{-3r}$

$=\dfrac{6(-5)-2(-3)^2}{-3(4)}$

$=\dfrac{-30-2(9)}{-12}$

$=\dfrac{-30-18}{-12}=\dfrac{-48}{-12}=\boxed{4}$

15.) $I = \dfrac{E}{R+S}$ for S

$I(R+S) = \dfrac{E}{\cancel{R+S}} \cdot \cancel{R+S}$

$I(R+S) = E$

$IR + IS = E$

$-IR \qquad -IR$

$IS = E - IR$

$S = \dfrac{E-IR}{I} = \boxed{\dfrac{E}{I} - R}$

16.) $3x^2 - 2x + 7 = 0$

Factors of $3 \cdot 7 = 21$

$\cancel{1 \cdot 21}$ none add to make -2

$\cancel{7 \cdot 3}$

So we move to complete the square

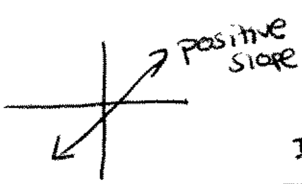
$\dfrac{3x^2-2x+7}{3} = \dfrac{0}{3} \rightarrow x^2 - \dfrac{2}{3}x + \dfrac{7}{3} = 0$

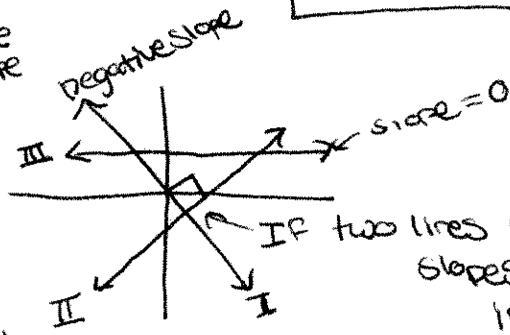
$x^2 - \dfrac{2}{3}x + \left(\dfrac{b}{2}\right)^2 = -\dfrac{7}{3} + \left(\dfrac{b}{2}\right)^2 \qquad b = -\dfrac{2}{3}$

$x^2 - \dfrac{2}{3}x + \dfrac{4}{36} = -\dfrac{7}{3} + \dfrac{4}{36}$

$\left(x + \dfrac{b}{2}\right)^2 = -\dfrac{20}{9} \rightarrow \boxed{\left(x - \dfrac{1}{3}\right)^2 = -\dfrac{20}{9}}$

7.)





If two lines intersect then their slopes are opposite reciprocals if they make a 90° angle.

So $|m_1| = |m_2|$

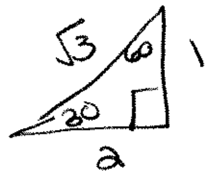
18.) E. $y = \sin(4x)$

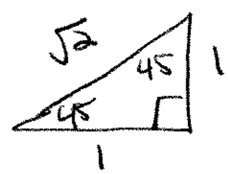
$$\text{Period} = \frac{2\pi}{4} = \boxed{\frac{\pi}{2}}$$

19.) $\sin(30) = \frac{1}{2}$

$\cos(30) = \frac{2}{\sqrt{3}}$

$$\boxed{\tan(45) = \frac{1}{1} = 1}$$





$\sin = \frac{opp}{hyp}$ $\cos = \frac{adj}{hyp}$

$\tan = \frac{opp}{adj}$

SOH CAH TOA!

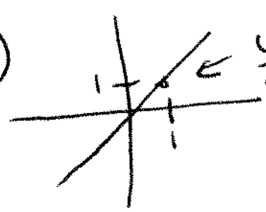
20.)

find a common denominator

$$\frac{\frac{1}{x}+1}{\frac{1}{x}} = \left(\frac{1}{x} + \frac{1 \cdot x}{x}\right) \cdot \frac{x}{1}$$

$$\frac{1+x}{x} \cdot \frac{x}{1} = \frac{1+x}{\cancel{x}} \cdot \frac{\cancel{x}}{1} = \frac{1+x}{1} = \boxed{1+x}$$

21.)



$\leftarrow \frac{\text{up } 1}{\text{right } 1} = \text{slope} = 1$

$m > 1$

22.) x = one room apt.

y = 2 room apt.

$450x \mp 600y = 6450$

$x + y = 12$

$y = (12 - x)$

$450x + 600(y) = 6450$

$450x + 600(12 - x) = 6450$

$450x + 7200 - 600x = 6450$

-7200

$-150x = -750$

$\overline{-150} \quad \overline{-150}$

$\boxed{x = 5}$

$y = 12 - (5)$

$\boxed{y = 7}$

23.) $V = t \cdot r$

$V = (4x+1)(\frac{1}{4}x-1)$

$V = x^2 - 4x + \frac{1}{4}x - 1$ $\rightarrow$ $-4x + \frac{1}{4}x$

$-\frac{4}{1}x + \frac{1}{4}x \rightarrow -\frac{16}{4}x + \frac{1}{4}x$

$= -\frac{15}{4}x$

$\boxed{V = x^2 - \frac{15}{4}x - 1}$

24.) $A = \frac{10}{x}$

white $= A - A_{blue}$

$A_{blue} = \frac{x}{x^2+10}$

$= \frac{10}{x} - \frac{x}{x^2+10}$ ↙ Find LCD

$= \frac{10(x^2+10)}{x(x^2+10)} - \frac{x \cdot x}{x(x^2+10)}$

$= \frac{10x^2+100-x^2}{x(x^2+10)} = \frac{9x^2+100}{x(x^2+10)} = \boxed{\frac{(3x)^2+10^2}{x(x^2+10)}}$

25.) $f(x) = \frac{3x-1}{2}$ $f^{-1}(0) = ?$

$y = \frac{3x-1}{2}$ switch x and y

$2 \cdot x = \left(\frac{3y-1}{2}\right) 2$ solve for y

$2x = 3y - 1$

$+1 \qquad +1$

$2x + 1 = 3y$

$\overline{3} \qquad \overline{3}$

$\boxed{\frac{2x+1}{3} = y}$

$f^{-1}(x) = y = \frac{2(0)+1}{3} = \boxed{\frac{1}{3}}$

26.) $\dfrac{\dfrac{3}{a}-\dfrac{3}{b}}{\dfrac{1}{x^2}+\dfrac{1}{y^2}}$ Find LCD: $\rightarrow \dfrac{\dfrac{3b}{ab}-\dfrac{3a}{ab}}{\dfrac{y^2}{x^2y^2}+\dfrac{x^2}{x^2y^2}}$

Change to multiplication and switch top and bottom of 2nd fraction!

$$\frac{3b-3a}{ab}\cdot\frac{x^2y^2}{x^2+y^2} \rightarrow \frac{(3b-3a)(x^2y^2)}{ab(x^2+y^2)} = \frac{-3(-b+a)(x^2y^2)}{ab(x^2+y^2)}$$

$$\boxed{= \frac{-3(a-b)(xy)^2}{ab(x^2+y^2)}}$$

27.) $\dfrac{3x}{5}$, $x=\dfrac{3}{9}$ $\qquad \dfrac{\frac{3}{1}\left(\frac{3}{9}\right)}{5} = \dfrac{\frac{9}{9}}{5} = \boxed{\dfrac{1}{5}}$

28.) $A=\pi r^2$

$r=\pi+3$

$A=\pi(\pi+3)^2$

$A=\pi(\pi+3)(\pi+3)$

$A=\pi(\pi^2+6\pi+9)$

$A=\pi(x^2+6x+9)$

typo: π should be x

$$\boxed{A=\pi x^2+6\pi x+9\pi}$$

29.) $\dfrac{x^2+4x+4}{(x+2)} \cdot \dfrac{(x+3)}{(x+2)}$

$\dfrac{(\cancel{x+2})(\cancel{x+2})}{(\cancel{x+2})} \cdot \dfrac{(x+3)}{(\cancel{x+2})}$

$\boxed{=(x+3)}$

30.) $V=\pi r^2 h$

$V=\pi(x^3-x^2-x+1)$

Grouping:

$V=\pi(x^2(x-1)-1(x-1))$

$V=\pi((x^2-1)(x-1))$

Since $V=\pi r^2 h$

Factor x^2-1:

$V=\pi((x-1)(x+1)(x-1))=(x-1)^2(x+1)$

$\boxed{\text{so } r=x-1 \text{ and } h=x+1}$

31.) $\dfrac{x^2+4x}{2x}=\dfrac{x(x+4)}{2x}$ so

a) can be simplified

$\dfrac{2x+4}{2}=\dfrac{\cancel{2}(x+2)}{\cancel{2}}$ so b) can be simplified.

$\dfrac{6x+5}{2} \rightarrow$ so c) can't be simplified!

check d) just in case

$\dfrac{xy}{x^2y^2}=\dfrac{xy}{(xy)^2}=\dfrac{1}{xy}$ so d) can be simplified.

32.) C=cost of dress

20% discount

$(C-.20C)-.05(C-.20C)$

$C-.20C-.05C+.01C$

$C-.25C+.01C$

$C-.24C$ So the dress would be a total of 24% off the cost and you would pay $\boxed{76\%}$ of the original price.

33.) $\frac{15(x^2+25)(3x-2)(y-2)(y+2)}{3(y^2-4)(3x-2)(x-5)}$

$=\frac{15(x^2+25)\cancel{(3x-2)}\cancel{(y-2)}\cancel{(y+2)}}{3\cancel{(y-2)}\cancel{(y+2)}\cancel{(3x-2)}(x-5)}=\boxed{\frac{5(x^2+25)}{x-5}}$

34.) $4x+5y=10$

$8x+10y=20$

A solution is the number of time two lines will cross each other.

solve each for y

$5y=-4x+10$ $\quad$ $8x+10y=20$

$y=-\frac{4}{5}+2$ $\quad$ $10y=-8x+20$

$y=-\frac{4}{5}x+2$

Since the lines are exactly the same they will cross infinity number of times, they are always touching.

35.) $f(x) = x^3 + 2x^2 - 2x + K$

$x = -2$

$0 = (-2)^3 + 2(-2)^2 - 2(-2) + K$

$0 = -8 + 8 + 4 + K$

$0 = 0 + 4 + K$

$-4 \qquad -4$

$\boxed{-4 = K}$

36.) Area = area of all the squares added up.

xy	x^2
y^2	xy

$A = y^2 + xy + xy + x^2$

$A = y^2 + 2xy + x^2$

$A = (y + x)(y + x) = \boxed{(x+y)^2}$

37.) $f(x) = x^3 - 2x^2 - x + 1$

$f(-x) = ?$

$f(-x) = (-x)^3 - 2(-x)^2 - (-x) + 1$

$\boxed{f(-x) = -x^3 - 2x^2 + x + 1}$

38.) $x^2 - 5x + 3 = 0$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{5 \pm \sqrt{25 - 4(1)(3)}}{2(1)} = \boxed{\frac{5 \pm \sqrt{13}}{2}}$$

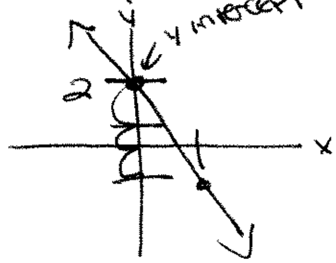
40.) $n^2\left(\frac{x}{2}\right)^n$ is the nth term

so for the 5th term let $n = 5$

$$5^2\left(\frac{x}{2}\right)^5 = 25\left(\frac{x^5}{2}\right)^5 = \boxed{25\left(\frac{x^5}{32}\right)}$$

41.) $y = -3x + 2$ slope, y intercept

$m = \dfrac{-3}{1}$ down 3, right 1



42.) $\left|-4-\left(-1\tfrac{1}{2}\right)\right|$

$\dfrac{2\cdot 1+1}{2} = \dfrac{3}{2}$

$= \left|-4-\left(-\tfrac{3}{2}\right)\right|$

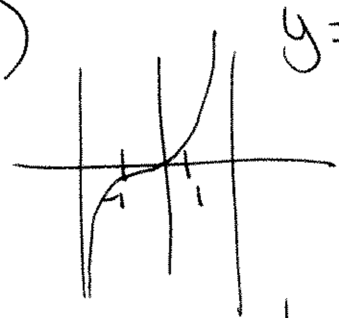
$= \left|-\tfrac{4}{1}+\tfrac{3}{2}\right| = \left|-\tfrac{8}{2}+\tfrac{3}{2}\right| = \left|-\tfrac{5}{2}\right| = \tfrac{5}{2} = \boxed{2.5}$

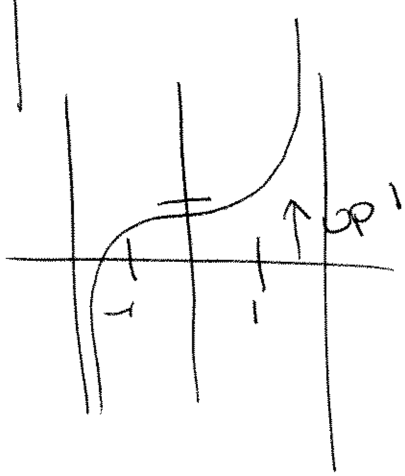
43.) $\dfrac{1}{x}+\dfrac{1}{9}+\dfrac{1}{b}=1$

$\dfrac{1}{x} = 1-\dfrac{1}{9}-\dfrac{1}{b} \qquad x = \dfrac{1}{1-\frac{1}{9}-\frac{1}{b}} = \dfrac{1}{\frac{9b}{9b}-\frac{b}{9b}-\frac{9}{9b}}$ comon LCD

$= \dfrac{1}{\frac{8b-9}{9b}} = 1\cdot\dfrac{9b}{8b-9} = \dfrac{9b}{8b-9} = \boxed{\dfrac{-9b}{-8b+9}}$ switch the signs for the answer!

44.) $y = \tan(\theta)+1$ up 1





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