Key

Rio Salado's Online College Algebra Accuplacer Review Questions (2013-2014)

#1. Teresa has 5 shirts, 3 pairs of shorts and 2 hats. How many different outfits can she wear consisting of one of each?

A) 45 B) 30 C) 60 D) 14 E) 11 $5 \cdot 3 \cdot 2 = 30$

#2a. Factor: $25a^2 - 9b^2$ $= (5a)^2 - (3b)^2 = (5a-3b)(5a+3b)$

A) $16a^2b^2$ B) $(5a+3b)^2$ C) $(5a-3b)^2$ D) $(25a-9b)(25a+9b)$ E) $(5a-3b)(5a+3b)$

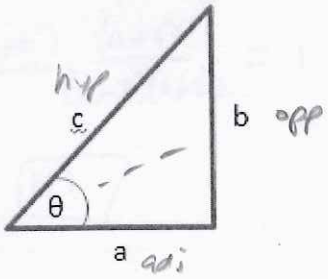
#2b. Factor: $(x+2)^2 - 4y^2$ $= (x+2)^2 - (2y)^2 = (x+2-2y)(x+2+2y)$

A) $(x+2-2y)(x+2+2y)$ B) $(x+2-2y)^2$ C) $(x+2-4y)(x+2+4y)$

D) $(x+2+2y)^2$ E) x^2+4-4y^2

#3. In the right triangle shown, $\sin\theta = \frac{opp}{hyp} = \frac{b}{c}$

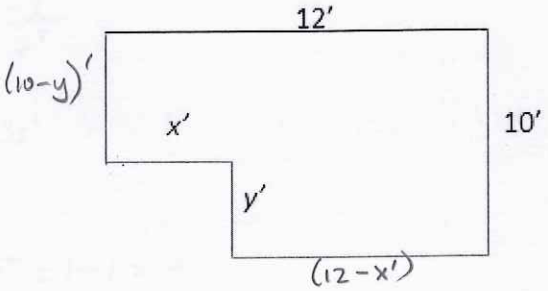
A) $\frac{a}{b}$ B) $\frac{a}{c}$ C) $\frac{b}{a}$ D) $\frac{b}{c}$ E) $\frac{c}{b}$



#4a. A rectangular room has dimensions as shown: What is its perimeter in feet?

A) $44-x-y$ B) $22+x+y$ C) 44

D) $44+x+y$ E) $22-(x+y)$



$P = 12 + 10 + x' + y' + 10 - y' + 12 - x'$

$P = 44$

#4b. A rectangular room has dimensions $x+4$ by $x-3$. What is its area in terms of x?

A) x^2-x+12 B) x^2-12 C) $2x+1$ D) $4x+2$ E) x^2+x-12 $(x+4)(x-3)$ x^2+x-12

#5a. $\frac{2}{\cos 2x} = \frac{2}{1} \cdot \frac{1}{\cos 2x} = \frac{2}{1} \cdot \frac{\sec 2x}{1} = 2\sec 2x$

A) $\tan 2x$ B) $2\sec 2x$ C) $\frac{1}{2}\sec x$ D) $\sin 2x$ E) $\frac{1}{2}\cos 2x$

#5b. $\frac{2}{\cot 3\theta} = \frac{2}{1} \cdot \frac{1}{\cot 3\theta} = \frac{2}{1} \cdot \frac{\tan 3\theta}{1} = 2\tan 3\theta$

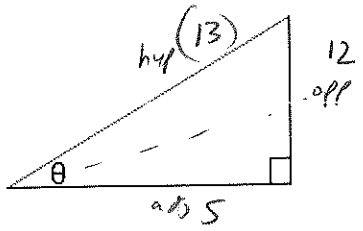
A) $2\sin 3\theta$ B) $\frac{\tan 3\theta}{2}$ C) $\frac{2\cos\theta}{3}$ D) $2\tan 3\theta$ E) $6\tan\theta$

#6. If $a=\frac{b}{2}$, what is the value of $4(a+1)^2$ in terms of b?

$4\left(\frac{b}{2}+1\right)^2 = 4\left(\frac{b}{2}+1\right)\left(\frac{b}{2}+1\right) = 4\left(\frac{b^2}{4}+b+1\right) = b^2+4b+4$

A) $2b^2+4b+4$ B) b^2+2b+1 C) $4b^2+2b+4$ D) $2b^2+2b+1$ E) b^2+4b+4

#7. If $\tan\theta=\frac{12}{5}$, then $\sec\theta=$ $\frac{1}{\cos\theta}=\frac{1}{\frac{5}{13}}=\frac{13}{5}$



A) $\frac{5}{12}$ B) $\frac{13}{5}$ C) $\frac{13}{12}$ D) $\frac{12}{13}$ E) $\frac{5}{13}$

#8. If $\begin{cases} a+b+c=7 \\ a+c=2 \\ 2a+b+c=11 \end{cases}$, what is the value of a?

$2a+b+c=11$
$-a-b-c=-7$
$a=4$

A) 5 B) 3 C) -2 D) 7 E) 4

#9. Simplify: $\left(\frac{a^2-3a+2}{a-1}\right)\bullet\left(\frac{a+2}{a^2-4}\right)$ $= \frac{(a-1)(a-2)}{(a-1)}\cdot\frac{(a+2)}{(a-2)(a+2)} = 1$

A) $\frac{a+2}{a-2}$ B) $\frac{3a+2}{a-2}$ C) a D) $\frac{a-2}{a+2}$ E) 1

#10. If $\left(\frac{-3xy}{z^2}\right)^2=-3p\left(x^2y^2\right)$, then $p=$ $\frac{9x^2y^2}{-3z^4x^2y^2} = \frac{-3}{z^4}$

A) $\frac{-3}{z^4}$ B) $3z^4$ C) $\frac{-1}{z^4}$ D) $\frac{-3xy}{z^4}$ E) $-3z^4$

#11. If $f(x)=x^3-3^{(x-1)}$, then $f(1)=$ $(1)^3-3^{(1-1)} = 1-3^0 = 1-1 = 0$

A) 4 B) 3 C) 2 D) 1 E) 0

#12. If $|3x-5|=10$, then $x=$

$3x-5=10$ or $3x-5=-10$
$3x=15$ $3x=-5$
$x=5$ $x=-\frac{5}{3}$

A) 5 *or* -5 B) $-\frac{5}{3}$ *only* C) 5 *or* $-\frac{5}{3}$ D) $\frac{5}{3}$ *only* E) 5 *only*

#13. If $f(x)=\frac{3}{x+1}$ *and* $g(x)=x+1$, *then* $f(g(x))=$ $\frac{3}{(x+1)+1} = \frac{3}{x+2}$

A) $3x+3$ B) $\frac{3}{x+2}$ C) $\frac{3}{x+1}$ D) 3 E) $3x+1$

#14. What is the domain of $g(x)=\dfrac{x-2}{\sqrt{x^2-4}}$

$x^2-4>0$
$x^2>4$ (outside cake) $x>2$ or $x<-2$

A) $x>2$ *or* $x<-2$ B) All Real numbers C) All Real numbers except 2 *and* -2
D) $-2<x<2$ E) All Real numbers except -2

#15a. If $\csc\theta$ is undefined, then $\sin\theta$ is

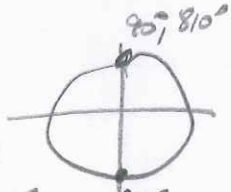
$\csc\theta = \frac{\text{something}}{0}$ so $\sin\theta = \frac{0}{\text{something}} = 0$

A) undefined B) $\frac{1}{2}$ C) 1 D) 0 E) -1

#15b. If $\sec\theta$ is undefined, then θ could **not** be

$\sec\theta = \frac{\text{something}}{0}$

$\cos\theta = \frac{0}{\text{something}} = 0$



$810 - 720 = 90°$

A) $300°$ B) $90°$ C) $-90°$ D) $270°$ E) $810°$

#16. Which of the following is **not** in the solutions set of $|x-3|\le 2$?

$-2 \le x-3 \le 2$
$+3 \quad +3 \quad +3$
$1 \le x \le 5$

A) 3 B) 4 C) 1 D) 0 E) 2

#17. What is the difference between the largest and the smallest y values of the function $y=2\sin 3x$?

$2(\pm 1) = \pm 2$

A) 3 B) 2 C) 6 D) 4 E) 1

#18. If a_n is a sequence whose n^{th} term is $2^{(n+1)}-2^{(n-1)}$, then what is a_4 ?

$2^{(4+1)} - 2^{(4-1)} = 2^5 - 2^3$
$= 32 - 8 = 24$

A) 32 B) 4 C) 64 D) 8 E) 24

#19a. If f is a quadratic function that has zeros that are the same distance in opposite directions from the origin, which of these is f ?

A) x^2-2x+1 B) x^2+1 C) x^2+4x D) x^2-x E) x^2-4

$(x+2)(x-2)$
$-2 \quad 2$

#19b. If f is a quadratic function that has zeros seven units apart, which of these is f ?

A) x^2-6x-7 B) x^2-8x+7 C) x^2+x-12 D) $x^2-8x+12$ E) x^2-7x+6

A) $(x-7)(x+1)$ $7 \quad -1$ $(d=8)$
B) $(x-1)(x-7)$ $1 \quad 7$ $(d=6)$
C) $(x+4)(x-3)$ $-4 \quad 3$ $(d=7)$
D) $(x-6)(x-2)$ $6 \quad 2$ $(d=4)$
E) $(x-1)(x-6)$ $1 \quad 6$ $(d=5)$

#20a. Which of the following lines has slope $-\frac{3}{4}$?

A) $4x-3y=1$ B) $4x+3y=6$ C) $3x+4y=2$ D) $3x-4y=12$ E) $x+y=-\frac{3}{4}$

$4y = -3x+2$
$y = -\frac{3}{4}x + \frac{1}{2}$

#20b. Which of the following lines has intercepts at $x=3$, and $y=2$?

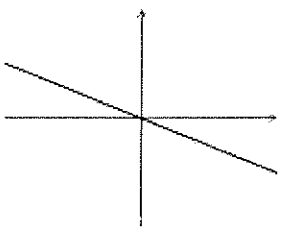
A) $4x-3y=1$ B) $4x+3y=6$ C) $3x+4y=2$ D) $3x-4y=12$ E) $x+y=-\frac{3}{4}$

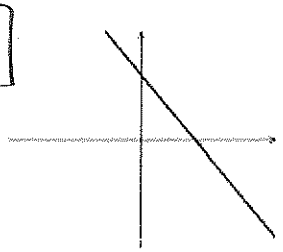
A) $2x+3y=6$ $x=3$ $y=2$
B) $2x-y=6$ $x=3$ $y=-6$
C) $3x-2y=6$ $x=2$ $y=-3$
D) $2x-3y=6$ $x=3$ $y=-2$
E) $3x+2y=6$ $x=2$ $y=3$

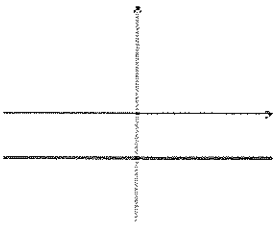
20c. Which of the following graphs could represent $3x+2y=12$?

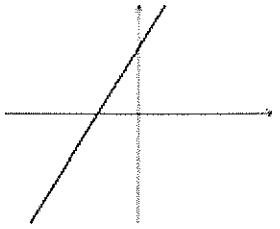
$2y = -3x + 12$

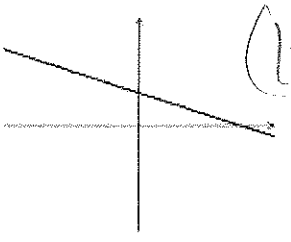
$y = -\frac{3}{2}x + 6$

A) 

B) 

C) 

D) 

E) 

(|slope| < 1)

#21a. Which of the following functions contains the points $(0,1)$ and $(2,1)$?

plug in → ✓ check

A) $y=2|x-1|$ B) $y=|x+1|$ C) $y=|x-1|$ D) $y=|x-2|$ E) $y=|2x-1|$

#21b. Which of the following quadratic functions contains the points $(-2,0)$ and $(3,0)$?

plug in → check

A) $y=x^2+x+6$ B) $y=x^2-x-6$ C) $y=x^2+3x-2$ D) $y=x^2+x-6$ E) $y=9x^2-4$

#22a. The curve $y=4^x$ intersects the line $y=8$ at which of the following points?

A) $(2,8)$ B) $(4,8)$ C) $(1,8)$ D) $\left(\frac{2}{3},8\right)$ E) $\left(\frac{3}{2},8\right)$

$8 = 4^x$

$2^3 = (2^2)^x$

$2^3 = 2^{2x}$ $\quad 2x = 3$ $\quad x = \frac{3}{2}$

#22b. At which x value(s) does the curve $y=x^2+2$ intersect the line $y=6$?

A) no values B) 4 *only* C) 4 *and* -4 D) 2 *and* -2 E) 2 *only*

$6 = x^2 + 2$

$x^2 = 4$

$x = \pm 2$

#23a. If $\frac{6}{3+\sqrt{3}} = a - b\sqrt{3}$, *then* $a-b=$

A) 6 B) 3 C) 9 D) 2 E) 1

$\frac{6(3-\sqrt{3})}{(3+\sqrt{3})(3-\sqrt{3})} = \frac{18-6\sqrt{3}}{9-3} = \frac{18}{6} - \frac{6\sqrt{3}}{6}$

$= 3 - \sqrt{3}$

$a = 3 \quad b = 1$

$3 - 1 = 2$

#23b. Where it is defined, $\frac{\sqrt{x}-2}{x-4}$ is equivalent to

A) $\frac{1}{\sqrt{x}}+\frac{1}{2}$ B) $\sqrt{x}-2$ C) $\frac{1}{\sqrt{x}}+2$ D) $\sqrt{x}+2$ E) $\frac{1}{\sqrt{x}+2}$

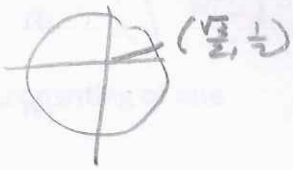
$\frac{(\sqrt{x}-2)(\sqrt{x}+2)}{(x-4)(\sqrt{x}+2)}$

$\frac{x-4}{x\sqrt{x}+2x-4\sqrt{x}-8}$

$\frac{1}{\sqrt{x}+2} = \frac{(x-4)1}{(x-4)(\sqrt{x}+2)} = \frac{(x-4)}{\sqrt{x}(x-4)+2(x-4)}$

#24. Which of the following functions contains the point $\left(\frac{\pi}{6}, 2\right)$?

A) $y = 2\sin x$ B) $y = \csc x$ C) $y = \tan x$ D) $y = 2\sec x$ E) $y = 2\cot x$



#25. $\sum_{k=-2}^{1} \frac{2k}{k+3} = ?$

A) $\frac{9}{2}$ B) -4 C) 5 D) $-\frac{9}{2}$ E) -5

#26a. f contains the points $(3,1)$ and $(1,-3)$. If f^{-1} is the inverse of f, what is the value of $f^{-1}(f(3))$

A) $\frac{1}{3}$ B) $-\frac{1}{3}$ C) 3 D) -1 E) 1

#26b. A linear function f has slope 2 and y-intercept 3. What are the slope and y-intercept of its inverse f^{-1}?

A) $\frac{1}{2}$ *and* -3 B) -2 *and* $\frac{1}{3}$ C) $\frac{1}{2}$ *and* $-\frac{3}{2}$ D) $\frac{1}{2}$ *and* $\frac{1}{3}$ E) -2 *and* -3

#27. The line $y = 3x + 1$ intersects the line $y = kx - 2$ where $x = 1$. What is the value of k?

A) 4 B) 7 C) 6 D) 1 E) 2

#28a. If $(2+i)(3+i) = a + bi$, what is the value of $a + b$?

A) 3 B) 2 C) 10 D) 5 E) 9

#28b. If $(3+i)^2 = a + bi$, what is the value of $a + b$?

A) 15 B) 8 C) 5 D) 14 E) 16

#29a. Mary's age now is 6 years more than twice the sum of the ages of her two children. In 3 years her age will be 22 years less than three times the sum of their ages. How old is Mary now?

A) 32 B) 35 C) 27 D) 29 E) 26

#29b. If Tanya could increase her running speed by 1 mph, she could complete a six mile race in 18 minutes less time. What is her current rate in mph?

A) 4 B) 5 C) 3.5 D) 4.5 E) 3

#30a. If $x - 3$ is a factor of $x^3 + bx^2 - 9$, then $b =$

A) 9 B) 1 C) -3 D) -2 E) 3

#30b. If $2x^3 - cx + 3$ is divided by $x + 2$, the remainder is -3. What is the value of c?

A) 5 B) 3 C) 1 D) 2 E) -3

29a

$m \quad a \quad b$

$m = 6 + 2(a+b)$

$m+3 = 3(a+3+b+3) - 22$

$m+3 = 3(a+b)+18-22$

$m+3 = 3(a+b)-4$

$(a+b) = \frac{m-6}{2}$

$(a+b) = \frac{m+3+4}{3} = \frac{m+7}{3}$

$\frac{m-6}{2} = \frac{m+7}{3}$

$3m-18 = 2m+14$

$m = 32$

29b

$18\text{min} = \frac{18}{60} = \frac{6(3)}{6(10)} = \frac{3}{10}\text{ hrs}$

$d = rt$

$6 = rt \Rightarrow t = \frac{6}{r}$

$6 = (r+1)(t-\frac{3}{10})$

$rt = (r+1)(t-\frac{3}{10})$

$rt = rt - \frac{3}{10}r + t - \frac{3}{10}$

$-\frac{3}{10}r + t - \frac{3}{10} = 0$

$-\frac{3}{10}r + \frac{6}{r} - \frac{3}{10} = 0$

$-\frac{3}{10}r^2 - \frac{3}{10}r + 6 = 0$

$-3r^2 - 3r + 60 = 0$

$3r^2 + 3r - 60 = 0$

$r^2 + r - 20 = 0$

$(r+5)(r-4) = 0$

$r = -5$ or 4

4 mph

30a

$$x-3 \overline{)\, x^3 + bx^2 + 0x - 9} \quad = \; x^2 + (b+3)x + 3$$

no remainder

$-(x^3 - 3x^2)$

$(b+3)x^2 + 0x$

$-((b+3)x^2 - 3(b+3)x)$

$3(b+3)x - 9$

$-(3x - 9)$

$(3(b+3) - 3)x \quad 0$ ← remainder

$3(b+3) - 3 = 0$

$3(b+3) = 3$

$b+3 = 1$

$b = -2$

check:

$$x-3 \overline{)\, x^3 - 2x^2 + 0x - 9} \quad = \; x^2 + x + 3$$

$-(x^3 - 3x^2)$

$x^2 + 0x$

$-(x^2 - 3x)$

$3x - 9$

$3x - 9$

0 ✓

30b

$$x+2 \overline{)\, 2x^3 + 0x^2 - cx + 3} \quad = \; 2x^2 - 4x + 8 \quad \text{remainder } -3$$

$-(2x^3 + 4x^2)$

$-4x^2 - cx$

$-(-4x^2 - 8x)$

$(-c+8)x + 3$

$-(3x + 6)$

-3 ←

$-c + 8 - 3 = 0$

$-c + 8 = 3$

$c = 5$

check:

$$x+2 \overline{)\, 2x^3 + 0x^2 - 5x + 3} \quad = \; 2x^2 - 4x + 3$$

$-(2x^3 + 4x^2)$

$-4x^2 - 5x$

$-(-4x^2 - 8x)$

$3x + 3$

$-(3x + 6)$

-3 ✓

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#1. Teresa has 5 shirts, 3 pairs of shorts and 2 hats. How many different outfits can she wear consisting of one of each?

A) 45 B) 30 C) 60 D) 14 E) 11

#2a. Factor: $25a^2-9b^2$

A) $16a^2b^2$ B) $(5a+3b)^2$ C) $(5a-3b)^2$ D) $(25a-9b)(25a+9b)$ E) $(5a-3b)(5a+3b)$

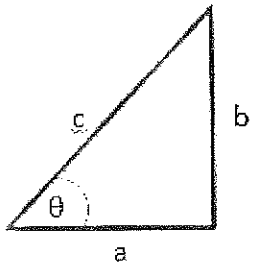
#2b. Factor: $(x+2)^2-4y^2$

A) $(x+2-2y)(x+2+2y)$ B) $(x+2-2y)^2$ C) $(x+2-4y)(x+2+4y)$

D) $(x+2+2y)^2$ E) x^2+4-4y^2

#3. In the right triangle shown, $\sin\theta =$

A) $\frac{a}{b}$ B) $\frac{a}{c}$ C) $\frac{b}{a}$ D) $\frac{b}{c}$ E) $\frac{c}{b}$



#4a. A rectangular room has dimensions as shown: What is its perimeter in feet?

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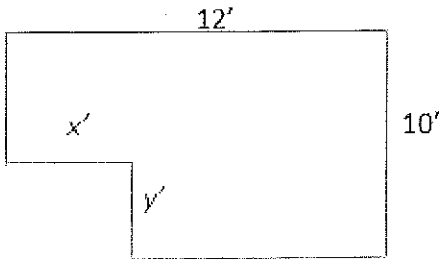
D) $44+x+y$ E) $22-(x+y)$



#4b. A rectangular room has dimensions $x+4$ by $x-3$. What is its area in terms of x?

A) x^2-x+12 B) x^2-12 C) $2x+1$ D) $4x+2$ E) x^2+x-12

#5a. $\frac{2}{\cos 2x} =$

A) $\tan 2x$ B) $2\sec 2x$ C) $\frac{1}{2}\sec x$ D) $\sin 2x$ E) $\frac{1}{2}\cos 2x$

#5b. $\frac{2}{\cot 3\theta} =$

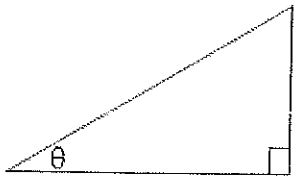
A) $2\sin 3\theta$ B) $\frac{\tan 3\theta}{2}$ C) $\frac{2\cos\theta}{3}$ D) $2\tan 3\theta$ E) $6\tan\theta$

#6. If $a=\frac{b}{2}$, what is the value of $4(a+1)^2$ in terms of b?

A) $2b^2+4b+4$ B) b^2+2b+1 C) $4b^2+2b+4$ D) $2b^2+2b+1$ E) b^2+4b+4

#7. If $\tan\theta=\frac{12}{5}$, then $\sec\theta=$

A) $\frac{5}{12}$ B) $\frac{13}{5}$ C) $\frac{13}{12}$ D) $\frac{12}{13}$ E) $\frac{5}{13}$



#8. If $\begin{cases} a+b+c=7 \\ a+c=2 \\ 2a+b+c=11 \end{cases}$, what is the value of a?

A) 5 B) 3 C) -2 D) 7 E) 4

#9. Simplify: $\left(\frac{a^2-3a+2}{a-1}\right)\bullet\left(\frac{a+2}{a^2-4}\right)$

A) $\frac{a+2}{a-2}$ B) $\frac{3a+2}{a-2}$ C) a D) $\frac{a-2}{a+2}$ E) 1

#10. If $\left(\frac{-3xy}{z^2}\right)^2=-3p\left(x^2y^2\right)$, then $p=$

A) $\frac{-3}{z^4}$ B) $3z^4$ C) $\frac{-1}{z^4}$ D) $\frac{-3xy}{z^4}$ E) $-3z^4$

#11. If $f(x)=x^3-3^{(x-1)}$, then $f(1)=$

A) 4 B) 3 C) 2 D) 1 E) 0

#12. If $|3x-5|=10$, then $x=$

A) 5 *or* -5 B) $-\frac{5}{3}$ *only* C) 5 *or* $-\frac{5}{3}$ D) $\frac{5}{3}$ *only* E) 5 *only*

#13. If $f(x)=\frac{3}{x+1}$ *and* $g(x)=x+1$, *then* $f(g(x))=$

A) $3x+3$ B) $\frac{3}{x+2}$ C) $\frac{3}{x+1}$ D) 3 E) $3x+1$

#14. What is the domain of $g(x)=\dfrac{x-2}{\sqrt{x^2-4}}$

A) $x>2$ *or* $x<-2$ B) All Real numbers C) All Real numbers except 2 *and* -2

D) $-2<x<2$ E) All Real numbers except -2

#15a. If $\csc\theta$ is undefined, then $\sin\theta$ is

A) undefined B) $\dfrac{1}{2}$ C) 1 D) 0 E) -1

#15b. If $\sec\theta$ is undefined, then θ could **not** be

A) $300°$ B) $90°$ C) $-90°$ D) $270°$ E) $810°$

#16. Which of the following is **not** in the solutions set of $|x-3|\le 2$?

A) 3 B) 4 C) 1 D) 0 E) 2

#17. What is the difference between the largest and the smallest y values of the function $y=2\sin 3x$?

A) 3 B) 2 C) 6 D) 4 E) 1

#18. If a_n is a sequence whose n^{th} term is $2^{(n+1)}-2^{(n-1)}$, then what is a_4?

A) 32 B) 4 C) 64 D) 8 E) 24

#19a. If f is a quadratic function that has zeros that are the same distance in opposite directions from the origin, which of these is f?

A) x^2-2x+1 B) x^2+1 C) x^2+4x D) x^2-x E) x^2-4

#19b. If f is a quadratic function that has zeros seven units apart, which of these is f?

A) x^2-6x-7 B) x^2-8x+7 C) x^2+x-12 D) $x^2-8x+12$ E) x^2-7x+6

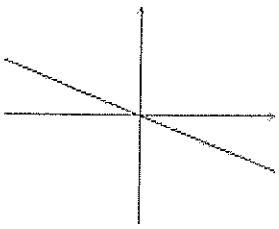
#20a. Which of the following lines has slope $-\dfrac{3}{4}$?

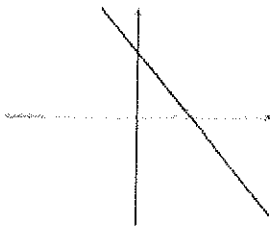
A) $4x-3y=1$ B) $4x+3y=6$ C) $3x+4y=2$ D) $3x-4y=12$ E) $x+y=-\dfrac{3}{4}$

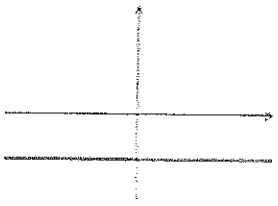
#20b. Which of the following lines has intercepts at $x=3$, and $y=2$?

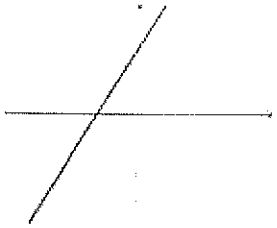
A) $2x+3y=6$ B) $2x-y=6$ C) $3x-2y=6$ D) $2x-3y=6$ E) $3x+2y=6$

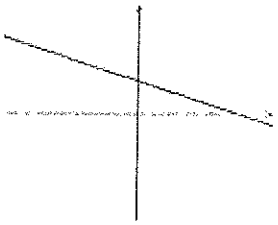
#20c. Which of the following graphs could represent $3x+2y=12$?

A) 

B) 

C) 

D) 

E) 

#21a. Which of the following functions contains the points $(0,1)$ and $(2,1)$?

A) $y=2|x-1|$ B) $y=|x+1|$ C) $y=|x-1|$ D) $y=|x-2|$ E) $y=|2x-1|$

#21b. Which of the following quadratic functions contains the points $(-2,0)$ and $(3,0)$?

A) $y=x^2+x+6$ B) $y=x^2-x-6$ C) $y=x^2+3x-2$ D) $y=x^2+x-6$ E) $y=9x^2-4$

#22a. The curve $y=4^x$ intersects the line $y=8$ at which of the following points?

A) $(2,8)$ B) $(4,8)$ C) $(1,8)$ D) $\left(\frac{2}{3},8\right)$ E) $\left(\frac{3}{2},8\right)$

#22b. At which x value(s) does the curve $y=x^2+2$ intersect the line $y=6$?

A) no values B) 4 *only* C) 4 *and* -4 D) 2 *and* -2 E) 2 *only*

#23a. If $\frac{6}{3+\sqrt{3}}=a-b\sqrt{3}$, *then* $a-b=$

A) 6 B) 3 C) 9 D) 2 E) 1

#23b. Where it is define, $\frac{\sqrt{x}-2}{x-4}$ is equivalent to

A) $\frac{1}{\sqrt{x}}+\frac{1}{2}$ B) $\sqrt{x}-2$ C) $\frac{1}{\sqrt{x}}+2$ D) $\sqrt{x}+2$ E) $\frac{1}{\sqrt{x}+2}$

#24. Which of the following functions contains the point $\left(\frac{\pi}{6}, 2\right)$?

A) $y = 2\sin x$ B) $y = \csc x$ C) $y = \tan x$ D) $y = 2\sec x$ E) $y = 2\cot x$

#25. $\sum_{k=-2}^{1} \frac{2k}{k+3} = ?$

A) $\frac{9}{2}$ B) -4 C) 5 D) $-\frac{9}{2}$ E) -5

#26a. f contains the points $(3,1)$ and $(1,-3)$. If f^{-1} is the inverse of f, what is the value of $f^{-1}(f(3))$

A) $\frac{1}{3}$ B) $-\frac{1}{3}$ C) 3 D) -1 E) 1

#26b. A linear function f has slope 2 and y-intercept 3. What are the slope and y-intercept of its inverse f^{-1}?

A) $\frac{1}{2}$ *and* -3 B) -2 *and* $\frac{1}{3}$ C) $\frac{1}{2}$ *and* $-\frac{3}{2}$ D) $\frac{1}{2}$ *and* $\frac{1}{3}$ E) -2 *and* -3

#27. The line $y = 3x+1$ intersects the line $y = kx-2$ where $x = 1$. What is the value of k?

A) 4 B) 7 C) 6 D) 1 E) 2

#28a. If $(2+i)(3+i) = a+bi$, what is the value of $a+b$?

A) 3 B) 2 C) 10 D) 5 E) 9

#28b. If $(3+i)^2 = a+bi$, what is the value of $a+b$?

A) 15 B) 8 C) 5 D) 14 E) 16

#29a. Mary's age now is 6 years more than twice the sum of the ages of her two children. In 3 years her age will be 22 years less than three times the sum of their ages. How old is Mary now?

A) 32 B) 35 C) 27 D) 29 E) 26

#29b. If Tanya could increase her running speed by 1 mph, she could complete a six mile race in 18 minutes less time. What is her current rate in mph?

A) 4 B) 5 C) 3.5 D) 4.5 E) 3

#30a. If $x-3$ is a factor of x^3+bx^2-9, then $b =$

A) 9 B) 1 C) -3 D) -2 E) 3

#30b. If $2x^3-cx+3$ is divided by $x+2$, the remainder is -3. What is the value of c?

A) 5 B) 3 C) 1 D) 2 E) -3