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Advanced Algebra and Functions

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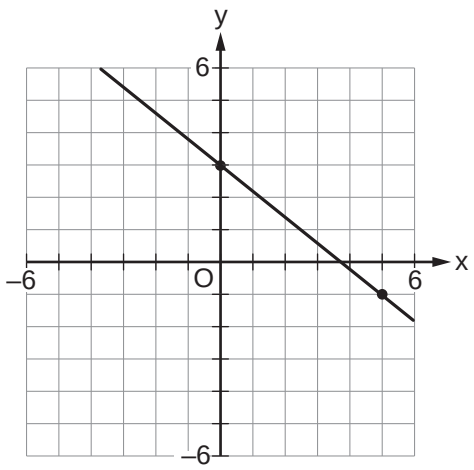

A. $y = \frac{5}{4}x$

B. $y = \frac{}{4}x + 3$

C. $y = \frac{4}{5}x$

D. $y = \frac{4}{5}x + 3$

A biologist puts an initial population of 500 bacteria into

A. $n = 500(2^{x})$
B. $n = 500(2^{6x})$
C. $n = 500(6^{x})$
D. $n = 500(6^{2x})$

A. 7
B. 3
C. –2
D. –7

A. $3(x + 2)(x – 4)$
B. $3(x – 2)(x + 4)$
C. $(x + 6)(x – 12)$
D. $(x – 6)(x + 12)$

12. For which of the following equations is $x = 6$ the only solution?

A. $(6x)^2 = 0$
B. $(x - 6)^2 = 0$
C. $(x + 6)^2 = 0$
D. $(x - 6)(x + 6) = 0$

13. If $f(x) = x^2 + 3x + 1$, what is $f(x + 2)$?

A. $x^2 + 3x + 3$
B. $(x + 2)^2 + 3(x + 2) + 1$
C. $(x + 2)(x^2 + 3x + 1)$
D. $x^2 + 3x + 9$

14. What, if any, is a real solution to $\sqrt{5x + 1} + 9 = 3$?

A. $\frac{1}{5}$
B. 7
C. $\frac{143}{5}$
D. ere is no real solution.

15. If $x \neq -2$ and $x \neq \frac{3}{2}$, what is the solution to $\frac{5}{x + 2} = \frac{x}{2x - 3}$?

A. 3 and 5
B. 2 and $\frac{3}{2}$
C. –2 and $\frac{3}{2}$
D. –3 and –5

L R and JL = PR
B. KL = QR and PR = JL
C. JK = PQ and KL = QR
% K Q and L R

17. In the function $f(x) = a(x + 2)(x - 3)^b$, a and b are both integer constants and b is positive. If the end behavior of the graph of $y = f(x)$ is positive

A. $x \log_2\left(\frac{7}{5}\right)$
B. $x \frac{\log_2 7}{5}$
C. $x \frac{\log_7 2}{5}$
D. $x \frac{\log_7 5}{2}$

$\frac{x \quad y}{\sqrt{x} \quad \sqrt{y}}$?

A. $\frac{x \quad y}{\sqrt{x \quad y}}$
B. $\sqrt{x \quad y}$
C. $\sqrt{x} + \sqrt{y}$
D. $x\sqrt{x} + y\sqrt{y}$

$\cos A = \frac{5}{8}$,

A. $\frac{3}{8}$
B. $\frac{5}{8}$
C. $\frac{\sqrt{39}}{8}$
D. $\frac{\sqrt{89}}{8}$

g(12) 3(12 8) 3(20)

12 3(x 8)

g(12) 3(12) 8

4
5

4
5

Choice B is correct. 7 K H R Q O \ H [S U H V V L R Q L Q F R U U H F W H [S O D L Q V W K D W V D W L V ® H V (x 6)² K H 0 H T X D W L R Q
is 6 & K R L F H $ L V L Q F R U U H F W E X W L Q F R U U H F W O \ H [S O D L Q V W K H F R Q V W D Q W L V R O X W L R Q W R W K H H T X D W L R Q
(6x)² 0 & K R L F H & L V L Q F R U U H F W E X W L Q F R U U H F W O \ H [S O D L Q V W K H F R Q V W D Q W L V R O X W L R Q W R W K H
H T X D W L R Q (x 6)² 0 & K R L F H ' L V L Q F R U U H F W E X W L Q F R U U H F W O \ H [S O D L Q V W K H F R Q V W D Q W L V R O X W L R Q
W R W K H H T X D W L R Q (x 6)² 0 x 6 L V D Q R W K H U V R O X W L R Q W R W K H H T X D W L R Q

Choice B is correct. 6 X E V W L W X W L Q J x 2 for x L Q W K H R U L J L Q D O I X Q F W L R Q J L Y H V
f(x 2) (x 2)² 3(x 2) 1 & K R L F H $ L V L Q F R U U H F W E X W L Q F R U U H F W O \ H [S O D L Q V W K H F R Q V W D Q W L V
L Q F R U U H F W O \ H [S O D L Q V W K H F R Q V W D Q W L V f(x) & K R L F H ' L V L Q F R U U H F W E X W L Q F R U U H F W O \ H [S O D L Q V
f(x) U H S O D F L Q J x 2 E \ x 2 W 7 K L V L V

Choice D is correct. 6 X E W U D F W L Q J F R Q V W D Q W I U R P J E R W K V L G H V R I W K H H T X D W L R Q \ L H O G V
√5x + 1 6 D Q G W K H U H D U H Q R U H D O V R O X W L R Q V W K D W D U H U H M H F W H G E \ W K H V T X D U H U R R W R I
D Q X P E H U E H L Q J Q H J D W L Y H V R W K H H T X D W L R Q K D V Q R U H D O V R O X W L R Q & K R
& D U H L Q F R U U H F W G X H W R F R P S X W L Q J D Q D Q G L Q F R U U H F W O \ H [S O D L Q L Q J Q V R O Y L Q J I R U
W K H V R O X W L R Q L Q W K H R U L J L Q D O H T X D W L R Q & K R L F H % L V L Q F R U U H F W E E F D X
H [W U D Q H R X V V R O X W L R Q W R W K H H T X D W L R Q

Choice A is correct. 7 R V R O Y H [X W W K H H T X D W L R Q I R U [P X O W L S O \ W R \ L H O G
x(x 2) 5(2x 3) 6 L P S O L I \ L Q J E R W K V L G H V R I W K H Q H Z H T X D W L R Q U H V X O W V L Q
x² 2x 10x 15 1 H [W V X E W U D F W P E R W K V L G H V R I W K H H T X D W L R Q D Q G D G G
W R E R W K V L G H V R I W K (x² 8x 15) W L P H V (x 3) I R U [3 W K H O H I W K D Q G
V L G H W K H U H T X D W L R Q F D Q E H U H Z U L W W H Q (x 3)(x 5) L Q , W K H U H I R U H [5 V
W K H U H K R X W 3 and x 5 & K R L F H V % & D Q G ' D U H S R V V L E O H U H V X O W V I U R P
P D W K H P D W L F D O H U U R U V Z K H Q V O Y L Q J W K H H T X D W L R Q I R U x

Choice A is correct. , I W Z R D Q J O H V D Q G W K H L Q F O X G H G V L G H R I R Q H W U L D Q J O H
D U H F R Q J U X H Q W W R F R U U H V S R Q G L Q J S D U W V R I D Q R W K H U W U L D Q J O H W K H W U
F R Q J U X H Q W 6 J and H D D U H F R Q J U X H Q W and R U H Q V S H F W L Y H O \
D Q G W K H V L G H O H Q J W K V E H W Z H H Q R D F K S D L U R I H [D Q J O H W K H Q
L W F D Q E H S U R Y H Q W K D W D Q R W K H U W U L D Q J O H E H R Q H V X H Q W & K R L F H V % D Q G & D U H
L Q F R U U H F W E E F D X V H R Q O \ Z K H Q W Z R V L G H V D Q G W K H L Q F O X G H G D Q J O H R I R Q H
F R Q J U X H Q W W R F R U U H V S R Q G L Q J S D U W V R I D Q R W K H U W U L D Q J O H F D Q W K H W U L D
W R E H F R Q J U X H Q W D Q G D Q J O H V J and P D U H Q R W L Q F O X G H G Z L W K L Q W K H F R U U H
S D L U V R I V L G H V J L Y H Q) X U W K H U V L G H V L G H D Q J O H F R Q J U X H Q F H Z R U Q V R Q O \
W U L D Q J O H V D Q G L W L V Q W J and P R Q U W K H W U L D Q J O H V
& K R L F H ' L V L Q F R U U H F W E E F D X V H W K H W U L D Q J O H V F D Q R Q O \ E H S U R Y H Q W R E
(Q R W F R Q J U X H Q W W K U H H V H W V R I F R U U H V S R Q G L Q J D Q J O H V D U H F R Q J U X H Q W

Choice D is correct. $ S R O \ Q R P L D O I X Q F W L R Q R I H Y H Q G H J U H H Z L W K D S R V L W L Y H
O H D G L Q J F R H ± F L H Q W Z L O O K D Y H S R V L W L Y H Q G E H K D Y L R U I R U E R W K Y H U \ O D
values of x D Q G Y H U \ O D U J H S R V L W L Y H Y D O X H V R I (x 2)(x 3) W K H Q W K H Y D O X H V R I
form f(x) a(x 2)(x 3)^b W R E H R I H Y H Q G H J U H H Z L W K D S R V L W L Y H O H D G L Q J
F R H ± F L H Q W W E H S R V L W L Y H D Q G

$(b)^x \quad y \qquad b \quad 0 \text{ and } b \quad 1 \qquad x \quad \log_b y$

$2^{5x} \quad 7 \qquad\qquad \log_2 7 \quad 5x$

$$\frac{\log_2 7}{5} = x$$

$(b)^x \quad y \qquad b > 0 \text{ and } b \quad 1$

$$\frac{x \quad y}{\sqrt{x} \quad \sqrt{y}}$$

$$\frac{(\sqrt{x})^2 \quad (\sqrt{y})^2}{\sqrt{x} \quad \sqrt{y}}$$

$$\frac{(\sqrt{x}+\sqrt{y})(\sqrt{x} \quad \sqrt{y})}{(\sqrt{x} \quad \sqrt{y})}$$

$$\frac{x \quad y}{\sqrt{x} \quad \sqrt{y}} \qquad \frac{\sqrt{x}+\sqrt{y}}{\sqrt{x}+\sqrt{y}},$$

$$\frac{(x \quad y)(\sqrt{x}+\sqrt{y})}{(\sqrt{x} \quad \sqrt{y})(\sqrt{x}+\sqrt{y})}$$

$$\frac{x\sqrt{x}+x\sqrt{y} \quad y\sqrt{x} \quad y\sqrt{y}}{x \quad \sqrt{xy}+\sqrt{xy} \quad y}$$

$$\frac{(x \quad y)(\sqrt{x}+\sqrt{y})}{(x \quad y)}$$

$$\frac{x \quad y}{\sqrt{x \quad y}}$$

A (cosA)

$$\frac{\text{the length of the side adjacent to angle } A}{\text{the length of the hypotenuse}} \qquad \frac{5}{8}$$

$a^2 \quad 5^2 \quad 8^2$

$a^2 \quad 64 \quad 25 \quad 39$

so $a \quad \sqrt{39}$