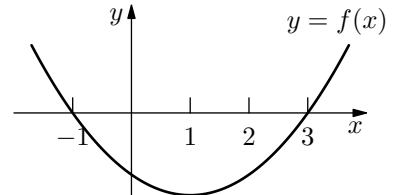


Calculus Readiness Test

Thompson Rivers University
Department of Mathematics & Statistics

suggested time: 45 minutes

1. The graph of a certain quadratic function $f(x)$ is shown to the right. The x -intercepts are at -1 and 3 . On what interval is $f(x) < 0$?



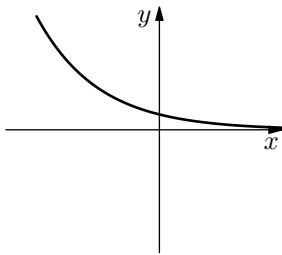
- (a) $(0, \infty)$ (b) $(-\infty, 3)$
(c) $(-1, \infty)$ (d) $(-1, 3)$
(e) $(-\infty, -1) \cup (3, \infty)$
2. Find the x -coordinate of the intersection of the graphs of $2x - y = -6$ and $x + y = -3$.

3. Simplify: $8^{1/3}16^{-1/2}$

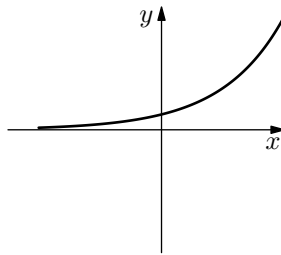
4. Solve for x : $\log_4(x + 1) = 2$

5. Solve for x : $\frac{(2x - 1)(x + 1)}{x - 1} = 0$

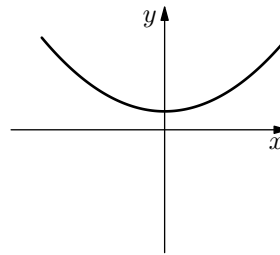
6. Which of the following best resembles the graph of $f(x) = 2^x$?



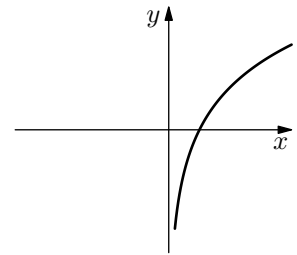
(a)



(b)

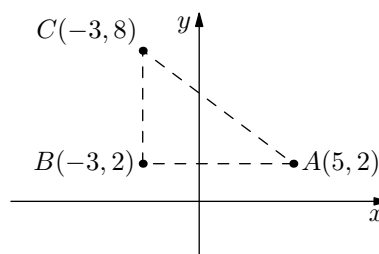


(c)



(d)

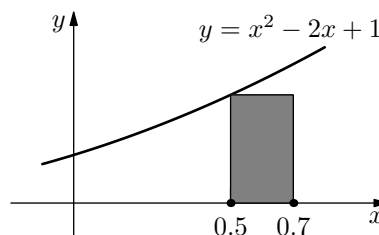
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7. In the given figure, find the distance between points A and C .



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8. If $f(x) = \frac{3x+4}{x+3}$ then $f(a+2) =$

- (a) 2 (b) $\frac{3a+7}{a+5}$ (c) $\frac{3a+6}{a+5}$ (d) $\frac{3a+4}{a+3}$ (e) $\frac{3a+10}{a+5}$

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9. Find the area of the shaded rectangle pictured to the right.



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10. Suppose the sides of a rectangle with length x and width y are each tripled. By how much does the area of the rectangle *increase*?

- (a) xy (b) $3xy$ (c) $8xy$ (d) $9xy$ (e) x^3y^3

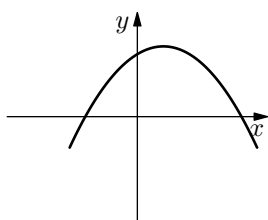
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11. $|x-1| \leq 2$ is equivalent to:

- (a) $x \geq 3$ (b) $x \leq 1$ (c) $-3 \leq x \leq 1$ (d) $-1 \leq x \leq 3$ (e) $-3 \leq x \leq 3$

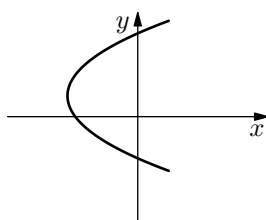
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12. If 2^{11} is approximately equal to 2000, then 2^{22} is approximately equal to

- (a) 4,000 (b) 40,000 (c) 400,000 (d) 4,000,000 (e) 2000^{11}

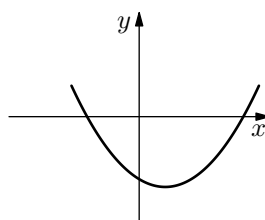
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13. Which of the following best resembles the graph of $y = 2 + x - x^2$?



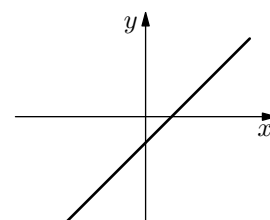
(a)



(b)



(c)



(e)

-
14. $\cos^2 \theta \tan \theta \csc \theta =$

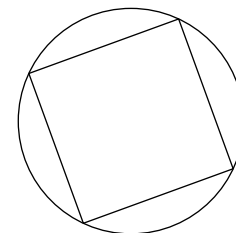
(a) $\cos \theta$ (b) $\sin \theta$ (c) $\tan \theta$ (d) $\sin^2 \theta \cos^2 \theta$ (e) $\sec \theta$

-
15. Simplify: $\frac{\sqrt{a^8 b^4}}{a^2 b}$

(a) $a^6 b^3$ (b) $a^4 b^2$ (c) $a^2 b$ (d) a^2 (e) b^2

-
16. A square is inscribed in a circle of radius r . Express the side length of the square in terms of r .

(a) $r/\sqrt{2}$ (b) $2r$ (c) r (d) $r/2$ (e) $\sqrt{2}r$



-
17. Solve for x : $\frac{9}{x-10} - \frac{204}{x^2-100} = 1$

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18. Evaluate $f(\pi)$ where $f(x) = \sin x + 3 \cos 2x$.

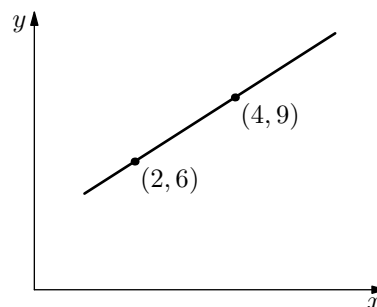
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19. If $f(x) = x^2 - 4x$ then $f(x+h) - f(x) =$

(a) $2xh + h^2 - 8x + 4h$ (b) $2xh + h^2 - 4h$ (c) h (d) $h^2 - 4h$

20. The length of a certain rectangle is 3 units more than double its width, w . Express the area of the rectangle in terms of w .

- (a) $w^2 + 3$ (b) $4w^2 + 6w$ (c) $2w^2 + 3w$ (d) $2w^2 + 6w$
-

21. If the equation of the line shown is written in the form $y = mx + b$ then the value of b is:



22. Which of the following is equivalent to the expression $\frac{1}{x} + \frac{1}{y}$?

- (a) $\frac{x}{y}$ (b) $\frac{x+y}{xy}$ (c) $\frac{1}{x+y}$ (d) $\frac{2}{x+y}$ (e) $\frac{1}{xy}$
-

23. If $f(x) = x^2 + 1$ and $g(x) = \sqrt{x} - 1$ then $g(f(x)) =$

- (a) $|x|$ (b) $\sqrt{x^2 + 1} - 1$ (c) x (d) $(\sqrt{x} - 1)^2 + 1$ (e) $(x^2 + 1)(\sqrt{x} - 1)$
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24. Find the value of $x < 0$ such that (x, y) is an intersection point of the graphs of $y = \frac{1}{2}x - 5$ and $y = x^2 + 2x - 15$.

25. The exact value of $\cos \frac{4\pi}{3}$ is:

- (a) $\sqrt{3}/2$ (b) $-\sqrt{3}/2$ (c) $1/2$ (d) $-1/2$ (e) none of these

Answer Key

Answer to 1: (d)

Answer to 2: -3

Answer to 3: $1/2$

Answer to 4: 15

Answer to 5: $x = \frac{1}{2}, x = -1$

Answer to 6: (b)

Answer to 7: 10

Answer to 8: (e)

Answer to 9: 0.05

Answer to 10: (c)

Answer to 11: (d)

Answer to 12: (d)

Answer to 13: (a)

Answer to 14: (a)

Answer to 15: (c)

Answer to 16: (e)

Answer to 17: $x = 2, x = 7$

Answer to 18: 3

Answer to 19: (b)

Answer to 20: (c)

Answer to 21: 3

Answer to 22: (b)

Answer to 23: (b)

Answer to 24: -4

Answer to 25: (d)