

Please complete this packet without the aid of a calculator.

1. If $a = 2$ and $b = -3$, then $\frac{(a-b)^2 + b}{(b-2a)^2 + a} =$

a. $-\frac{2}{3}$

b. $-\frac{2}{5}$

c. $-\frac{3}{26}$

d. $\frac{22}{51}$

e. $\frac{28}{49}$

2. In the system of equations $\begin{cases} 3x + y = 1 \\ x - 3y = 17 \end{cases}$, $x =$

a. -8

b. $-\frac{7}{4}$

c. 2

d. $\frac{9}{2}$

e. 9

3. In a room with 35 men, 80% of the occupants are women. How many women are in the room?

a. 28

b. 63

c. 105

d. 140

e. 175

4. The inequality $|x - 4| > 3$ is equivalent to

a. $x < -7$ or $x > 7$

b. $1 < x < 7$

c. $-3 < x < 3$

d. $x < -1$ or $x > 7$

e. $x < 1$ or $x > 7$

5. $(27a^{-3}b^6c^3)^{\frac{1}{3}} =$

a. $3b^2$

b. $3ab^2c$

c. $\frac{3b^2c}{a}$

d. $\frac{9b^2c}{a}$

e. $\frac{27b^2c}{a}$

6. For what value of t does $\frac{2t-1}{t+3} = -2$?

a. $-\frac{7}{4}$

b. $-\frac{5}{4}$

c. $-\frac{5}{12}$

d. $\frac{7}{4}$

e. There is no value of t satisfying this equation.

7. The line segment in the figure shown to the right is a portion of the line whose equation is

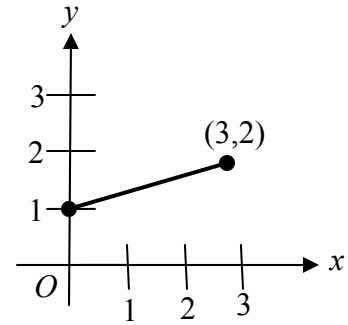
a. $y = \frac{1}{3}x + 1$

b. $y = \frac{1}{3}x + 3$

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

d. $y = 3x + 1$

e. $y = 3x + 3$



8. If $8^{2-x} = 4^{3x}$, then $x =$

a. $\frac{1}{4}$

b. $\frac{2}{7}$

c. $\frac{1}{2}$

d. $\frac{2}{3}$

e. $\frac{4}{5}$

9. $\left(\frac{(a+b)^2}{a^2-b^2}\right)\left(\frac{a-b}{a+b}\right) =$

a. $\frac{a-b}{a+b}$

b. $\frac{a+b}{a-b}$

c. $a+b$

d. $\frac{1}{a+b}$

e. 1

10. The number $\log_3 13$ is between

a. 0 and 1

b. 1 and 2

c. 2 and 3

d. 3 and 4

e. 4 and 5

11. What is the radian measure of an angle whose degree measure is 72° ?

a. $\frac{5}{2\pi}$

b. $\frac{2\pi}{5}$

c. $\frac{\pi}{5}$

d. $\frac{2}{5}$

e. $\frac{1}{5}$

12. If $f(x) = x^2 + 2x + 3$, then $f(a-1) =$

a. $a^2 + 2$

b. $a^2 + 2a$

c. $a^2 + 2a + 2$

d. $a^2 + 2a + 6$

e. $a^2 + 4a + 2$

13. $\frac{x+1}{x(x-1)} - \frac{1}{2(x-1)} =$

a. $\frac{1}{x-1}$

b. $\frac{1}{2(x-1)}$

c. $\frac{1}{2x(x-1)}$

d. $\frac{x+1}{2x(x-1)}$

e. $\frac{x+2}{2x(x-1)}$

14. If $f(x) = ax + b$ and $f(2) = 4$, then $a =$

a. $-\frac{b}{2}$

b. $-\frac{b}{4}$

c. 0

d. 2

e. $\frac{1}{2}$

15. From the information given in the table and in the figure shown to the right, which of the following best approximates the length of BC ?

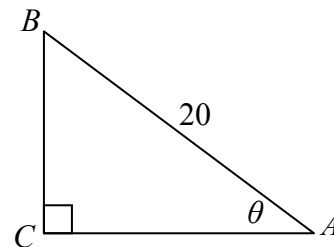
a. 12.9

b. 15.3

c. 16.8

d. 26.1

e. 31.1



$\sin \theta$	$\cos \theta$	$\tan \theta$
.643	.766	.839

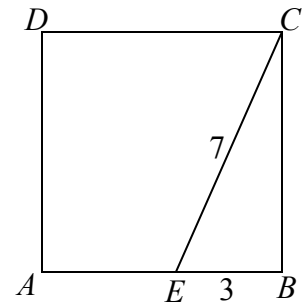
16. The inequality $x^2 - 2x < 8$ is equivalent to which of the following?
- a. $x < 4$ or $x > -2$ b. $x < -4$ or $x > 2$ c. $-4 < x < 2$
 d. $-2 < x < 4$ e. $x < 4$

17. What number must be added to $9x^2 + 9x$ to form a perfect square?

- a. $\frac{1}{4}$ b. $\frac{3}{2}$ c. $\frac{9}{4}$ d. 3 e. 9

18. The area of square $ABCD$ shown to the right is

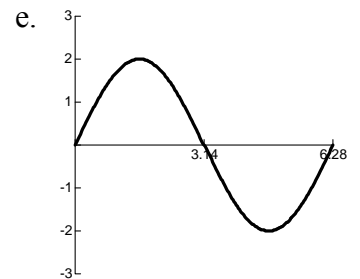
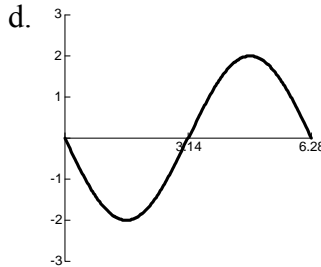
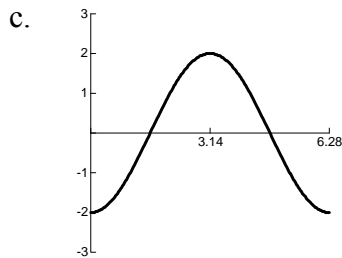
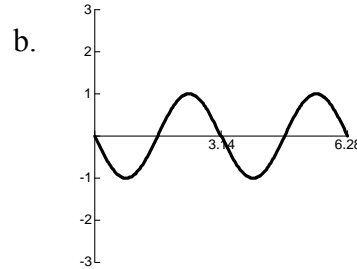
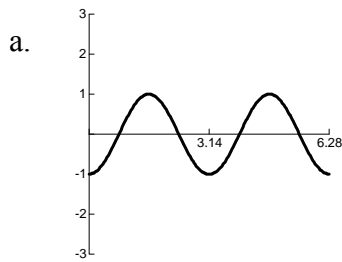
- a. 16 b. 36 c. 40
 d. 49 e. 58



19.
$$\frac{\frac{21-7x}{x+3}}{\frac{x^2-3x}{2x+3}}$$

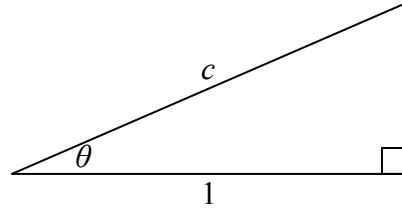
- a. $\frac{-14}{x}$ b. $\frac{-7}{x}$ c. $\frac{-7x}{x^2-9}$
 d. $\frac{-7(2x+3)}{x(x+3)}$ e. $\frac{7(2x+3)}{x(x+3)}$

20. Which of the following could be a portion of the graph of $y = -\sin 2x$?



21. In the figure shown to the right, $\tan \theta =$

- a. $\sqrt{c^2 - 1}$
- b. $\frac{1}{\sqrt{c^2 - 1}}$
- c. $\sqrt{c^2 + 1}$
- d. $\frac{1}{\sqrt{c^2 + 1}}$
- e. $\frac{1}{c}$



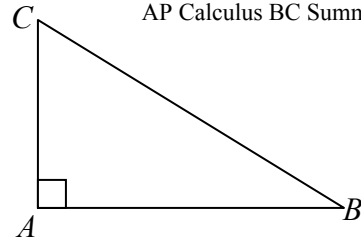
22. $\frac{x^{4b+1}}{x^{2-b}} =$

- a. x^3
- b. x^{4b}
- c. x^{2b+2}
- d. x^{3b-1}
- e. x^{5b-1}

23. Which of the following could be a portion of the graph of $y = (x - 2)^2$?

- a.
- b.
- c.
- d.
- e.

24. In right triangle ABC shown to the right, $AC = 3x$ and $BC = 5x$. If the perimeter of triangle ABC is 84, then $x =$

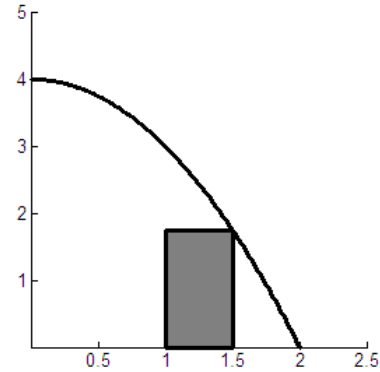


- a. $\frac{21}{4}$ b. $\frac{28}{3}$
 c. 4 d. 7 e. 12

25. The perimeter of a rectangular field is P feet. The width of the field is 200 feet less than its length. In terms of P , what is the length of the field in feet?

- a. $\frac{P-200}{2}$ b. $\frac{P+200}{2}$ c. $\frac{P-400}{4}$
 d. $\frac{P-200}{4}$ e. $\frac{P+400}{4}$

26. A portion of the graph of $f(x) = 4 - x^2$ is shown to the right. What is the area of the shaded rectangle?

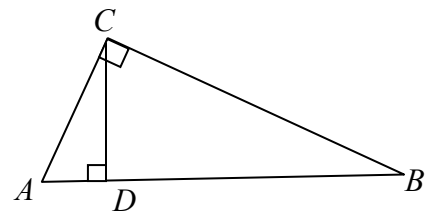


- a. 2.625 b. 2.250
 c. 1.125 d. 0.875
 e. 0.750

27. Which of the following are the roots of $x^2 - 5x - 2 = 0$?

- a. $\frac{-5 \pm \sqrt{17}}{2}$ b. $\frac{-5 \pm \sqrt{33}}{2}$ c. $\frac{5 \pm \sqrt{17}}{2}$
 d. $\frac{-5 \pm \sqrt{21}}{2}$ e. $\frac{5 \pm \sqrt{33}}{2}$

28. In right triangle ABC shown to the right, if $AB = 14$ and $BC = 12$, then $BD =$



- a. 10 b. $\frac{72}{7}$
 c. $\frac{12}{7}\sqrt{13}$ d. $2\sqrt{13}$
 e. $2\sqrt{42}$

29. If $x + a = \frac{b}{3}x$ and $b \neq 3$, then $x =$

a. $\frac{3a}{b}$

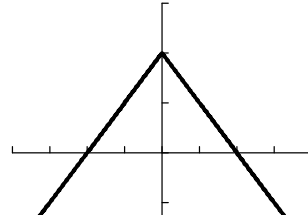
b. $\frac{a}{b-3}$

c. $\frac{3a}{b-3}$

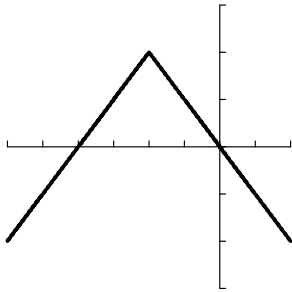
d. $\frac{a}{b+3}$

e. $\frac{3a}{b+3}$

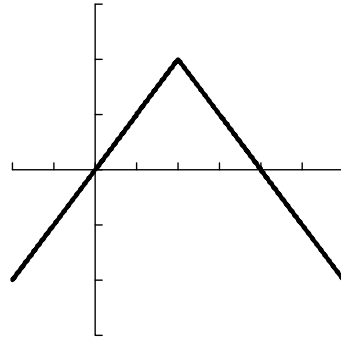
30. The graph of $y = h(x)$ is shown in the figure to the right. Which of the following could be the graph of $y = h(x+2)$?



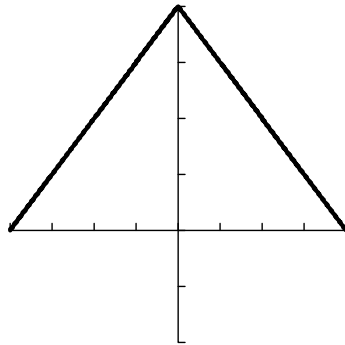
a.



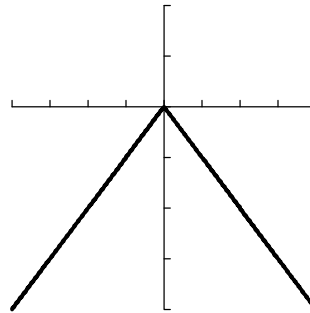
b.



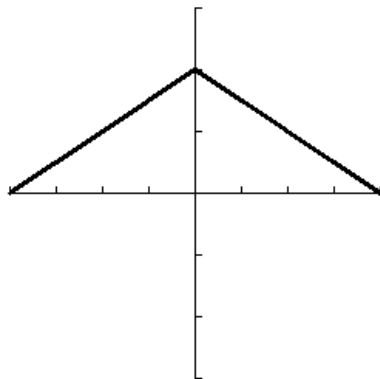
c.



d.



e.

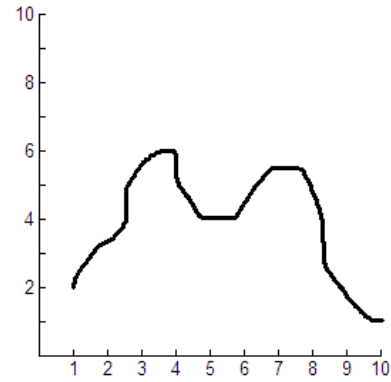


36. $\sqrt{4x^4 + 36x^2 + 81} =$

- a. $2x^2 + 9$ b. $2x^2 + 6x + 9$ c. $4x^2 + 9$
 d. $(2x^2 + 9)^2$ e. $(2x + 9)^2$

37. The graph of the function $y = f(x)$ is shown to the right. For exactly how many values of x does $f(x) = 3$?

- a. 0 b. 1
 c. 2 d. 3
 e. 4



38. Which of the following could be a portion of the graph of $y = |\log_2 x|$?

