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1. Suppose you invest \$1600 at an annual interest rate of 4.6% compounded continuously. How much will you have in the account after 4 years?

A. \$800.26

B. \$6,701.28

C. \$10, 138.07

D. \$1,923.23

$$Pe^{rt}$$
$$1600e^{.046 \times 4}$$

Answer: D



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2. Write the equation in logarithmic form.

$$125^{\frac{4}{3}} = 625$$

A. $\log_{\frac{4}{3}} 625 = 125$

B. $3 \log_4 625 = 125$

C. $\log_{125} 625 = \frac{4}{3}$

D. $\log_{625} 125 = \frac{3}{4}$

Answer:

C



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3. $6e^{4x} - 2 = 3$

Use natural logarithms to solve the equation. Round to the nearest thousandth.

$$6e^{4x} - 2 = 3$$

A. -0.448

B. 0.327

C. 0.067

D. -0.046



$$6e^{4x} - 2 = 3$$

$$+2 \quad +2$$

$$6e^{4x} = 5$$

$$\frac{6e^{4x}}{6} = \frac{5}{6}$$

$$e^{4x} = \frac{5}{6}$$

$$\frac{4x}{4} = \frac{\ln\left(\frac{5}{6}\right)}{4}$$

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4. Is the sequence arithmetic? If so, identify the common difference.

-2.4, 9.8, 22, 34.2, ...

A. yes, 12

B. yes, 12.2

C. yes, 12.3

D. no



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5. Write the explicit formula.

-2.4, 9.8, 22, 34.2, ...

$$a_n = a_1 + d(n-1)$$

$$a_n = d \cdot n + a_0$$

$$a_n = 12.2n - 14.6$$



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6.

$$-7n + 12$$

Find the 50th term of the sequence ¹²5, -2, -9, -16, ...

a. -352

b. -343

c. -338

d. -331

$$+ 5, -2, -9, -16, \dots$$

Answer:



$$-7(50) + 12$$



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7. Find the missing term of the geometric sequence.

45, ■, 1620, ...

a. ± 9720 b. ± 51 c. ± 6 d. ± 270 

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8.Use summation notation to write the series $2 + 4 + 6 + 8 + \dots$ for 10 terms.

A. $\sum_{n=1}^{10} 2n$

B. $\sum_{n=1}^{10} (n+2)$

C. $\sum_{n=1}^{10} n$

d. $\sum_{n=0}^{10} 2n$

Answer: A

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9. Evaluate the Series.

$$\sum_{n=3}^8 5n$$

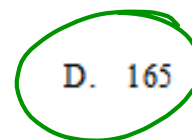
A. 125

B. 38

C. 210

D. 165

ANS:



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10.

Evaluate the infinite geometric series. Round to the nearest hundredth if necessary.

$$18 + 6 + 2 + \dots$$

A. 27

B. 3

C. 9

D. 54

ANS: A



$$\frac{a_1}{1-R} = \frac{18}{1-\frac{1}{3}}$$

$$18 + 6 + 2 + \dots$$

$$R = \frac{6}{18} = \frac{1}{3}$$

$$\frac{18}{\frac{2}{3}} =$$

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11. Does the infinite geometric series diverge or converge? Explain.

$$3 + 9 + 27 + 81 + \dots$$

- A. It converges; it does not have a sum. C. It diverges; it does not have a sum.
 B. It diverges; it has a sum. D. It converges; it has a sum.

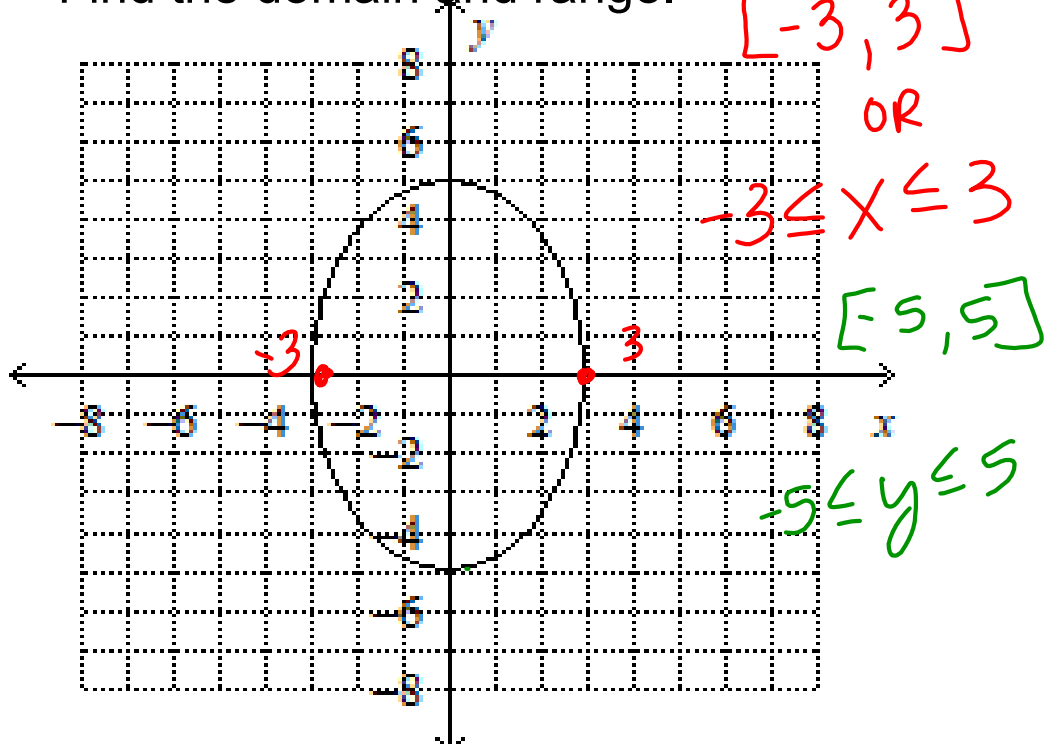
ANS:

$$R = 3 > 1$$

$$3 + 9 + 27 + 81 + \dots$$

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12. Find the domain and range.



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13. Write the equation for the ellipse with...

height of 4 units and width of 5 units

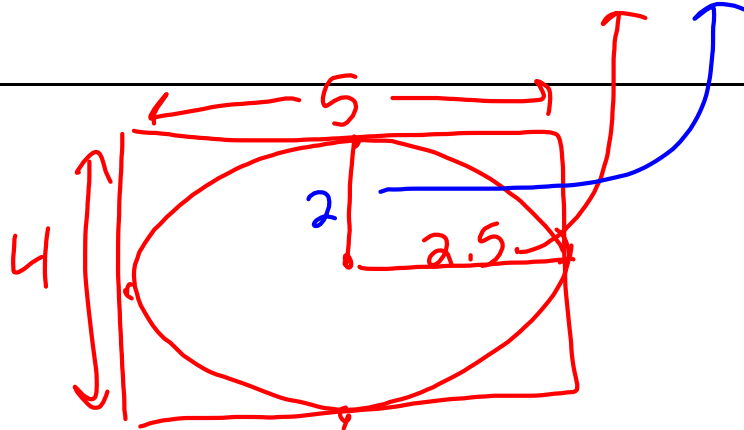
A. $\frac{x^2}{5} + \frac{y^2}{4} = 1$

C. $\frac{x^2}{4} + \frac{y^2}{5} = 1$

B. $\frac{x^2}{4} + \frac{y^2}{6.25} = 1$

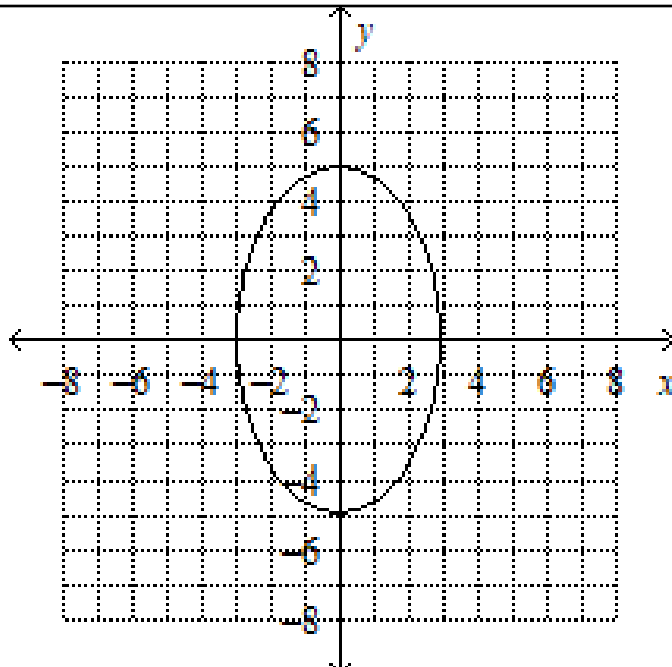
D. $\frac{x^2}{6.25} + \frac{y^2}{4} = 1$

ANS:



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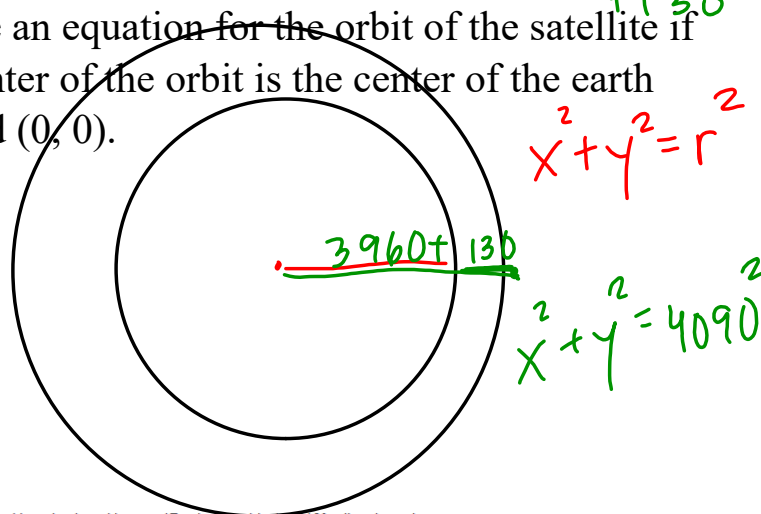
14. Write the equation for the ellipse



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15. A satellite is launched in a circular orbit around the earth at an altitude of 130 miles above the surface. the diameter of the Earth is $\frac{7920}{2}$ miles.

Write an equation for the orbit of the satellite if the center of the orbit is the center of the earth labeled $(0, 0)$.



A satellite is launched in a circular orbit around Earth at an altitude of 120 miles above the surface. The diameter of Earth is 7920 miles. Write an equation for the orbit of the satellite if the center of the orbit is the center of the Earth labeled $(0, 0)$.

- A. $x^2 + y^2 = 14,400$
- B. $x^2 + y^2 = 4080$
- C. $x^2 - y^2 = 4080$
- D. $x^2 + y^2 = 16,646,400$

ANS: D

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16. Write the equation of the ellipse in standard form that has vertices at $(6, 0)$ and $(0, -2)$

$$\frac{x^2}{36} + \frac{y^2}{4} = 1$$

$(6, 0)$ $(0, -2)$
 \uparrow \uparrow
 a b

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17. Write an equation for the ellipse with foci at $(0, \pm 8)$ and vertices at $(0, \pm 11)$

c

a

$$\frac{x^2}{57} + \frac{y^2}{121} = 1$$

$$\frac{11^2}{121} - \frac{8^2}{64}$$

$$c^2 = a^2 - b^2$$

$$8^2 = 11^2 - b^2$$

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18.

Simplify the rational expression. State any restrictions on the variable.

$$\frac{p^2 - 4p - 32}{p + 4}$$

A. $-p + 8; p \neq -4$

B. $p - 8; p \neq -4$

C. $-p - 8; p \neq 4$

D. $p + 8; p \neq 4$

ANS:



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19.

Find the horizontal asymptote of the graph of $y = \frac{6x^2 + 5x + 9}{7x^2 - x + 9}$.

A. $y = \frac{6}{7}$

C. $y = 1$

B. $y = 0$

D. no horizontal asymptote

ANS:



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20. $\frac{x^2 - 16}{x^2 + 5x + 6} \div \frac{x^2 + 5x + 4}{x^2 - 2x - 8}$

A. $\frac{(x - 4)^2}{(x + 3)(x + 1)}$; $x \neq -3, -1$

B. $\frac{(x + 4)^2(x + 1)}{(x + 2)^2(x + 3)}$; $x \neq -3, -2, 4$

C. $\frac{(x - 4)^2}{(x + 3)(x + 1)}$; $x \neq -4, -3, -2, -1, 4$

D. $\frac{1}{(x + 3)(x + 1)}$; $x \neq -4, -3, -2, -1, 4$

ANS:



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21. Subtract

$$\frac{b^2 - 2b - 8}{b^2 + b - 2} - \frac{6}{b - 1}$$

$$\frac{(b-4)(\cancel{b+2})}{(\cancel{b+2})(b-1)} + \frac{-6}{b-1}$$

A. $b - 10$

B. $\frac{b^2 - 2b - 14}{b^2 + b - 2}$

$$\frac{b-4}{b-1} + \frac{-6}{b-1}$$

C. $\frac{b - 4}{b - 1}$

D. $\frac{b - 10}{b - 1}$

ANS:



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22. Solve.

$$\frac{g+4}{g-2} = \frac{g-5}{g-8}$$

A. $-\frac{22}{3}$

B. 22

C. -22

D. 14

ANS: D



$$(g+4)(g-8) = (g-2)(g-5)$$

$$\cancel{g^2} - 8g + 4g - 32 = \cancel{g^2} - 5g - 2g + 10$$

$$-4g - 32 = -7g + 10$$

$$+7g \qquad \qquad +7g$$

$$3g - 32 = 10$$

$$+32 \qquad +32$$

$$\frac{3g}{3} = \frac{42}{3}$$

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