

2次関数 解答

目次1へ 問題へ

§1 関数 $y = ax^2$

1. (1) $y = \pi x^2$ (2) $y = 4x^2$

2. (1) $y = ax^2$ $a = \frac{y}{x^2} = \frac{72}{(-3)^2} = \frac{72}{9} = 8$ $y = 8x^2$

(2) $a = \frac{y}{x^2} = \frac{-8}{2^2} = \frac{-8}{4} = -2$ $y = -2x^2$

練習

1. (1) $y = ax^2$ $a = \frac{6}{30^2} = \frac{6}{900} = \frac{1}{150}$ $y = \frac{1}{150}x^2$

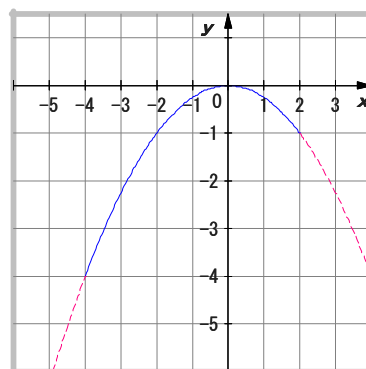
(2) $y = \frac{1}{150} \times 50^2 = \frac{2500}{150} = \frac{50}{3} = 16.67m$

$y = \frac{1}{150} \times 60^2 = \frac{3600}{150} = 24m$

§3 関数 $y = ax^2$ の値の変化

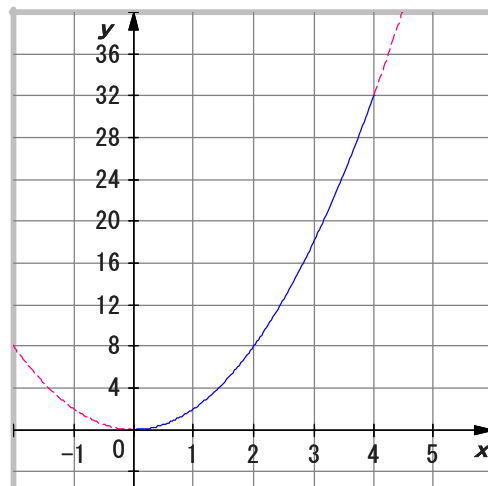
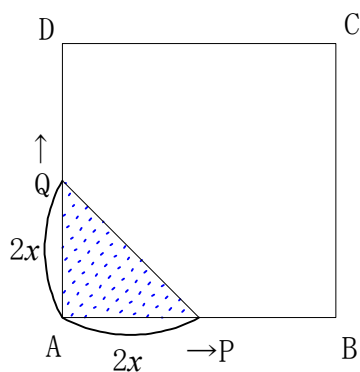
1. $y = -\frac{1}{4}x^2$ ($-4 \leq x \leq 2$) ……右図

y の変域 $-4 \leq y \leq 0$



2. 点P, Q は x 秒間に $2x$ cm 動くので,

$y = \frac{1}{2} \times 2x \times 2x = 2x^2$ ($0 \leq x \leq 4$)



変化の割合

3. (1) $\frac{5^2 - 3^2}{5 - 3} = \frac{16}{2} = 8$

(2) $\frac{(-2)^2 - (-4)^2}{-2 - (-4)} = \frac{-12}{2} = -2$

4. (1) $2(1 + 2) = 6$

(2) $2(3 + 4) = 14$

(3) $2(3.5 + 4) = 15$

練習

1. (1) $3(2 + 5) = 21$

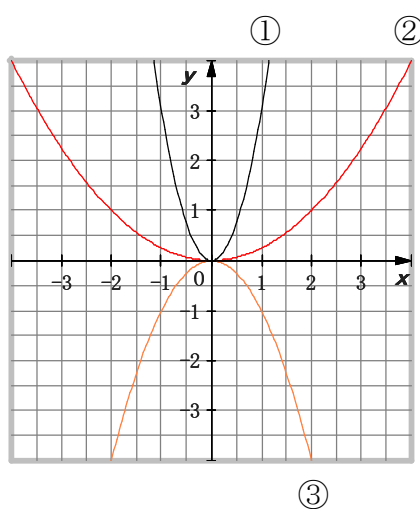
(2) $-3(2 + 5) = -21$

問題

1. ① $y = 3x^2$

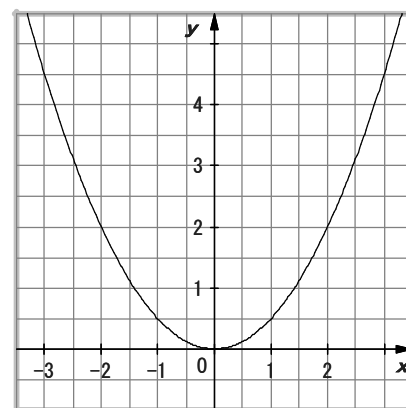
② $y = \frac{1}{4}x^2$

③ $y = -x^2$



2. (1) $a = \frac{1}{2}$

(2) $y = \frac{1}{2} \times 1.5^2 = \frac{1}{2} \times \left(\frac{3}{2}\right)^2 = \frac{9}{8} = 1.125$



3. (1) $0 \leq y \leq 4$

(2) $-8 \leq y \leq 0$

4. (1) $-\frac{1}{2}(1 + 3) = -2$

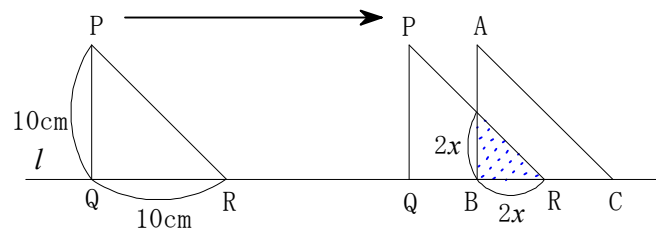
(2) $-\frac{1}{2}(-3 - 1) = 2$

5. $y = ax^2$, $a(2 + 4) = 3$, $a = \frac{1}{2}$, $y = \frac{1}{2}x^2$

6. $\triangle PQR$ は、 x 秒間に $2x$ cm 移動する。

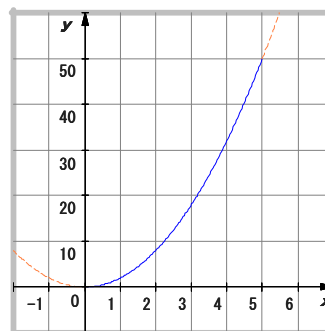
$$(1) y = \frac{1}{2} \times 2x \times 2x = 2x^2$$

$$(0 \leq x \leq 5)$$

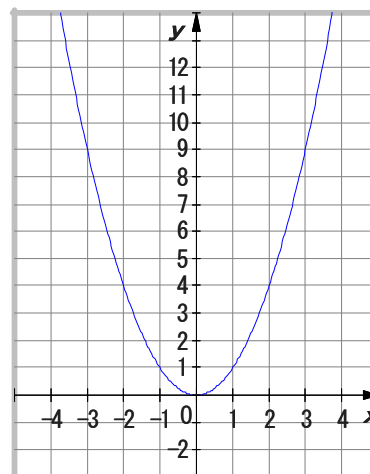


(2) 右図

$$(3) 0 \leq y \leq 50$$



7. $y = x^2$ のグラフ



8. (1) $A(-2,2)$, $B(4,8)$

(2) 求める直線の式を、 $y = ax + b$ とすると
この直線は 2点 A, B を通るから

$$-2a + b = 2$$

$$4a + b = 8$$

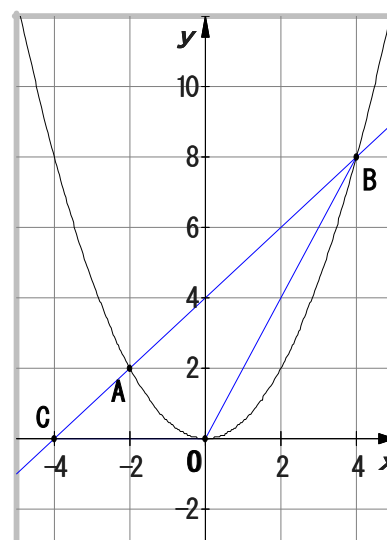
この連立方程式を解いて、 $a = 1$, $b = 4$
よって、求める直線の式は $y = x + 4$

(3) 点C の座標は $C(-4,0)$

$\triangle BCO$ の底辺 $CO = 4$

$\triangle BCO$ の高さは 点B の y 座標 8

$$\triangle BCO = \frac{1}{2} \times 4 \times 8 = 16$$



以上